Italian Botanist 21: 109–138 (2026)
doi: 10.3897/italianbotanist.21.183349
https://italianbotanist.pensoft.net

RESEARCH ARTICLE

Italian Botanist
Published by Società Botanica Italiana

The contribution of amateur botanists to the advancement of botanical science in the first half of the 19th century: The case of Joseph Martin Neumayer (1791–1840)

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Academic editor: Sandro Bogdanović | Received 23 December 2025 | Accepted 4 March 2026 | Published 16 April 2026

Citation: Marić M, Jasprica N, Maslek J (2026) The contribution of amateur botanists to the advancement of botanical science in the first half of the 19th century: The case of Joseph Martin Neumayer (1791–1840). Italian Botanist 21: 109-138. https://doi.org/10.3897/italianbotanist.21.183349

Abstract

Joseph Martin Neumayer (1791–1840) was a dedicated naturalist who played a key role in documenting the flora of southern Dalmatia in the early 19th century. Through systematic fieldwork from the Dalmatian coast to inland mountains, as well as the islands, Neumayer collected plant specimens across diverse habitats, ranging from sea level to high altitudes. He collaborated closely with Roberto Visiani, sending well-documented herbarium material that contributed to his Flora Dalmatica and facilitated the description of seventeen taxa new to science. Neumayer's correspondence reveals his commitment to meticulous collection, identification, and knowledge exchange, as well as the practical challenges of field research in a malarial, rugged, and politically complex region. Analysis of preserved specimens indicates that some of the species Neumayer collected remain rare in the Croatian flora today. His work exemplifies the crucial link between local collectors and established botanists in advancing 19th-century Mediterranean botanical knowledge.

Keywords

Archival documents, eastern Adriatic, Flora Dalmatica, herbarium collections, plant collecting, *scientia amabilis*

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Introduction

The practice of one botanist collecting plant specimens on behalf of another was already common in Dalmatia, a region in the Adriatic part of southern Croatia, as early as the 16th century, and represented one of the earliest forms of collaboration among botanists. Among others, these included Luigi Anguillara (ca. 1512–1570), the first prefect of the Botanical Garden in Padua, and the Swiss botanist Caspar (Gaspard) Bauhin (1560–1624) (Mägdefrau 1992). Their botanical expeditions to the Eastern Mediterranean, particularly those undertaken by Bauhin, gradually made it possible to assign a precise identity to many of the plants described by Dioscorides (ca. AD 70) and other ancient authors (e.g. Inić and Gašparac 2022; Minelli 2025; and references therein). When collecting plants, collectors, both trained scholars and inexperienced botanists, took great care to bring back and report specific species to the person who had commissioned the work. The recipient incorporated this material into herbarium collections, catalogues, or publications.

This was a period in which botanical education was obtained through the study of medicine (Jahn 2000), and many renowned botanists also practiced as physicians or apothecaries, such as Pietro Andrea Mattioli (1500–1577) and, somewhat later, Carolus Clusius (1526–1609), the first truly scientific botanist, regarded as one of the most influential figures of the pre-Linnaean era (Stearn 1958; Egmond 2010).

The time after the Linnaean period (mid-18th century), and even more so the first half of the 19th century may be considered the "Period of Collectors" (Durberšić 2011), in the territory of present-day Croatia. Between 1804 and 1815, Europe was profoundly shaped by the Napoleonic Wars, and a new political order was established that redrew the continent's borders (Vick 2014). After Napoleonic Wars two kingdoms - the Kingdom of Croatia with Slavonia as well as the Kingdom of Dalmatia were unified within the Austrian Empire (Judson 2016), and although these years were marked by warfare and instability, Austrian botanical circles encouraged the development of natural history research.

At the beginning of the 19th century, Dalmatia was still largely *terra incognita* from both floristic and faunistic perspectives (Coen 1996). In 1801–1802, the Croatian scholar Josip Vincent Host (1755–1836) continued the tradition of botanical exploration along the Dalmatian coast (Čvrljak 1993). His botanical journey built upon the work of foreign researchers, primarily German and Italian, who had begun to arrive in Dalmatia with increasing frequency in the late 18th century. In 1818, the Austrian lawyer and botanist Franz Edler von Portenschlag-Ledermayr (1772–1822) visited Dalmatia (Coen and Petricioli 1996). Soon afterwards, the region was explored by the German botanist Friedrich Gottlieb Bartling (1798–1875), who studied the flora of the northeastern Adriatic islands (Kvarner), and by naturalist Muzio Tommasini (1794–1879) from Trieste (Italy). Between 1828 and 1831, the Austrian military officer and botanical collector Franz Ludwig von Welden (1782–1853) stayed in the Dalmatian city of Zadar; he travelled across the entire Kingdom of Dalmatia collecting plants and subsequently published several articles (Welden 1836, 2023).

In the first half of the 19th century, the most prominent botanist specialising in the Mediterranean flora may be the Croatian scientist of Italian descent Roberto Visiani (1800–1878), born in the town of Šibenik in northern Dalmatia. In 1827, after graduating as a physician from the University of Padua, Visiani returned to Dalmatia and began a systematic investigation of its flora (Grubišić 1983). Visiani's skill lay particularly in his ability to establish numerous connections with plant collectors throughout Dalmatia and to inspire a broad circle of local intellectuals to engage in botany. He collaborated extensively with local amateur botanists and promoted among the educated elite of Dalmatia the pursuit of botany as the *scientia amabilis* i.e. "beloved science" (Linnaeus 1751) in the 1830s and 1840s.

Thus, in the first half of the 19th century, a network of informal research centres emerged across Dalmatia, from Zadar in the north to Budva in the south, on the Dalmatian islands, and in the hinterland, where enthusiasts, botanists, amateur naturalists, collectors, locals, and naturalised foreigners were active. Many of them collaborated with Visiani in preparing his monumental work "Flora Dalmatica" (Visiani 1826, 1842–1852, 1872, 1877). In addition to those above mentioned, important contributors included contemporary locals such as Andreas Alschinger (Zadar), Franz Petter (1798–1853) and Maria Seleban de Cattani (1789–1780) (Split), Luigi Stalio (1799–1882), Matija Botteri (1808–1877) (the island of Hvar), and Joseph Martin Neumayer (Dubrovnik), among many others (e.g. Čvrljak 1993; Coen and Petricioli 1996). By establishing a channel of communication between professional botanists and amateur botanists, Visiani and many others sought to disseminate their findings and facilitate further botanical research.

The aim of this paper is to provide new insights into the life and work of Joseph Martin Neumayer, a plant collector and enthusiast with a keen interest in the flora of this region, about whose life and relationship with Visiani very little is known to date. The paper seeks to reconstruct his biography and activities in order to better understand the functioning of the relationship between "major botanists", in this case Roberto Visiani, and plant collectors (florists), their challenges, and their mutual interactions, based on an analysis of archival documents, correspondence, and preserved herbarium collections. Furthermore, the paper examines Neumayer's contribution to floristics, particularly his role in advancing knowledge of the flora of southern Dalmatia and the surrounding areas, both in his own time and from a contemporary perspective.

Material and methods

Study area description

Dalmatia, located in southern Croatia on the eastern coast of the Adriatic Sea (Fig. 1), includes numerous islands and islets, as well as a coastal belt that forms part of the outer high-karst Dinarides, predominantly composed of carbonate rocks (Tišljar et al. 2002). The most common soils developed on this bedrock are Calcocambisols (brown

Figure 1. Map of Neumayer's plant collection sites for Roberto Visiani (black circle) in Dalmatia.

soils), Calcomelanosols (black soils) and „terra rossa" (red Mediterranean soil) on limestone and dolomite (Bogunović et al. 1996). The climate in this area is Mediterranean, with mild, humid, and rainy winters and hot, dry summers (see Médail 2008). This climate in the coastal zone and on the islands enables the development of eu-Mediterranean vegetation dominated by evergreen shrubs and sclerophyllous trees, with the holm oak (*Quercus ilex* L.) being the most important tree species. These stands are almost completely degraded trough the history and replaced with maquis, garrigues, rocky grasslands and other anthropogenic vegetation types. In contrast, the Dalmatian hinterland has a temperate humid climate with warm summers and regular winter frosts, where thermophilic deciduous oak forests (mainly *Quercus pubescens* Willd.) would be natural potential vegetation (e.g., Vukelić 2012; Pandža et al. 2026). The highest elevations in Dalmatia are Mt Dinara (Sinjal, 1,831 m a.s.l.) and Mt Biokovo (Sveti Jure, 1,762 m a.s.l.), which are also the highest peaks in Croatia.

The Dalmatia region contains 34 Important Plant Areas (IPAs), parts of the NATURA 2000 network in Croatia, and 144 protected areas of different rank and managements, and it exhibits high structural vegetation diversity (for details, see Nikolić et al. 2010). The Dalmatian Archipelago is a significant hotspot of vascular plant diversity with high levels of endemism, due to its diverse microhabitats and island isolation, making it crucial for regional conservation (Nikolić et al. 2015). However, human impact has become increasingly evident over recent decades, especially due to the coastal infrastructure development that has accompanied the depopulation of the Dalmatian hinterland. Reduced grazing pressure on grasslands has generally allowed the natural succession to move toward scrub and forest, while fires continue to occur frequently (Pandža et al. 2026).

Sources of data and analyses

The research is based on several primary archival sources. To establish accurate genealogical data on Joseph Martin Neumayer, archival records from birth register (Parish Deutschfeistritz, bapt. reg. 3, fol. 91 (1789–1831), Matricula Online further in text: MO-3:91(1789–1831)) and death register (Dubrovnik Diocese Archives, Kuna death register, Certified copy 1840; further in text: DDA-1840) as well as probate documents (Dubrovnik State Archive Vol. E – Probate records, Probate of Giuseppe Neumayer, file XLVIII/24; further in text: HR DSA-156, G.N. XLVIII/24) were examined.

Neumayer's botanical oeuvre was reconstructed through an analysis of contemporary professional and scientific materials, and primarily through archival documents preserved in the archives of the Botanical Garden of the University of Padua, which houses the herbarium specimens Neumayer sent over fourteen years of collaboration to Roberto Visiani. These specimens form part of Visiani's "Flora Dalmatica" collection (Fig. 2) (PAD). Neumayer's letters and lists of plant specimens sent to Visiani were transcribed and translated from Italian to Croatian (Fig. 3, Table 1) (Biblioteca dell'Orto Botanico di Padova: 38/4.3 - Ar.B.25; further in text UNIPD 38/4.3 - Ar.B.25).

Neumayer's herbarium specimens deposited in Visiani's "Flora Dalmatica" collection (PAD), as well as those in the herbarium collection of Domenico Pappafava in the city of Zadar (Vujčić-Karlo et al. 2009), were analysed by recording locality data, taxonomic status (POWO 2024), bibliographic information, and herbarium metadata. Their IUCN status (Nikolić 2024), endemism, and rarity were assessed following the criteria of Nikolić et al. (2015).

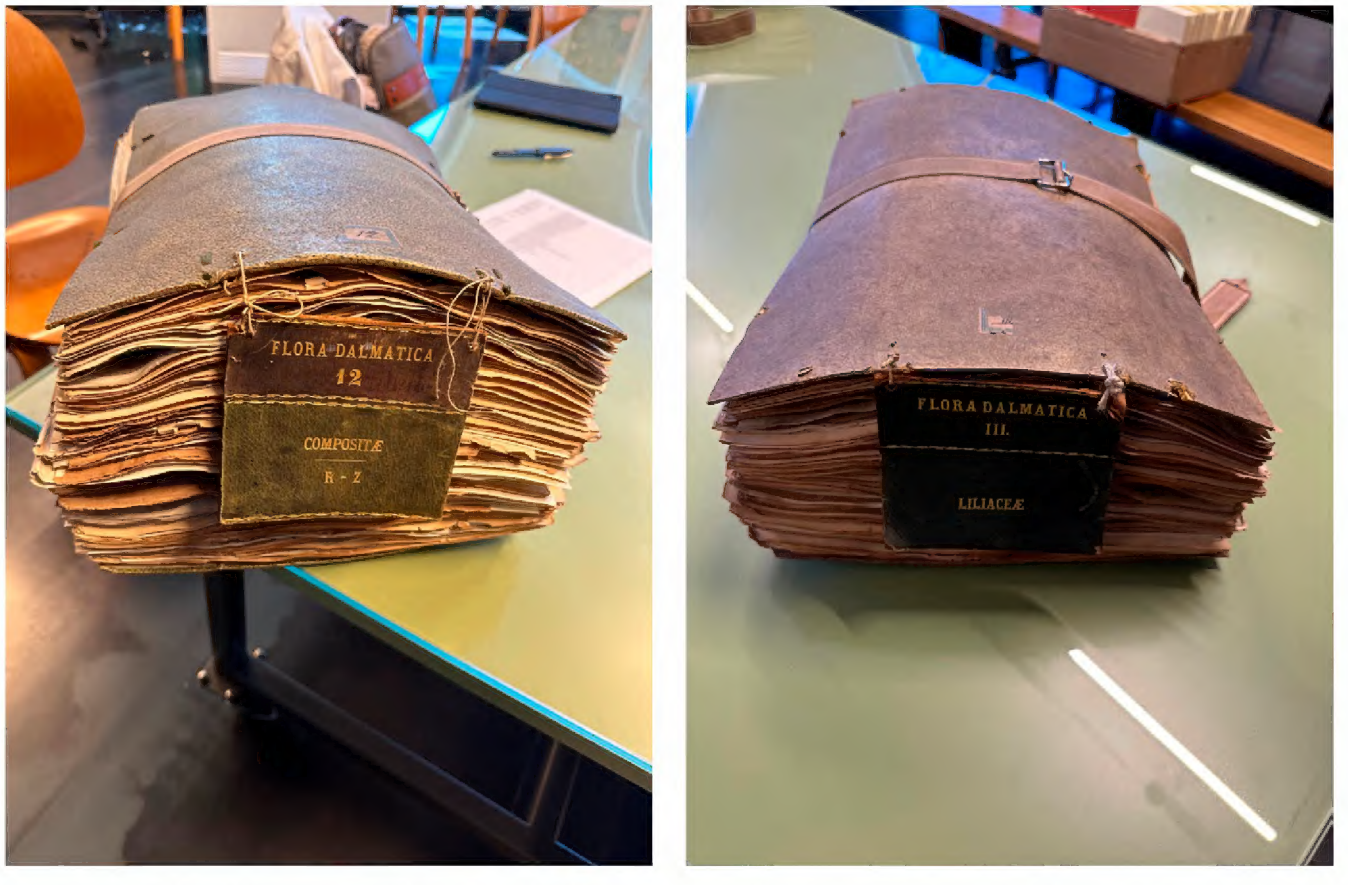

Figure 2. Bundle of herbarium sheets in the herbarium collection of Visiani's "Flora Dalmatica" in Padua (photo: M. Marić).

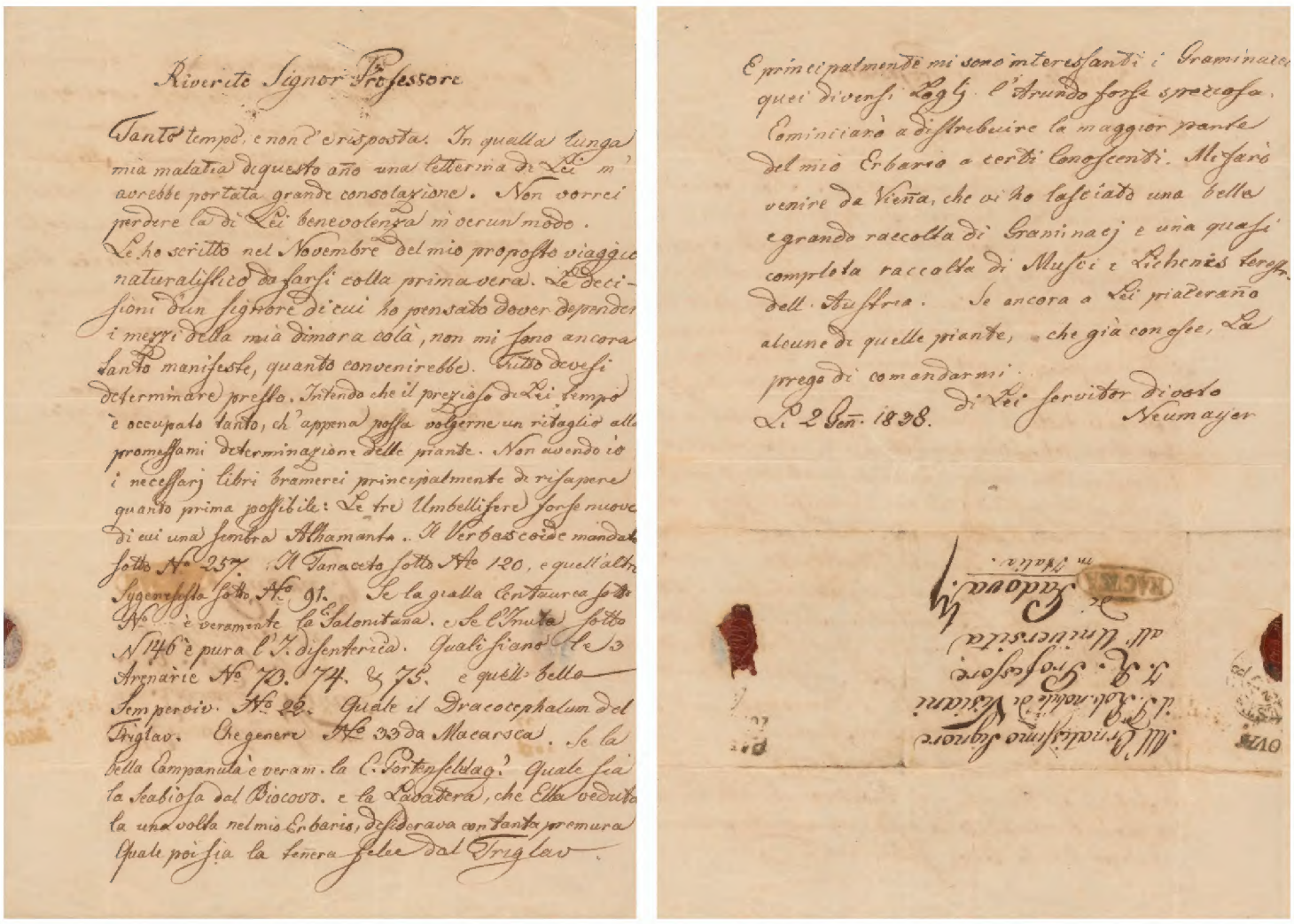

Figure 3. Letter from the Neumayer-Visiani correspondence, 2 Jan 1838 (UNIPD 38/4.3 - Ar.B.25). Available at https://phaidra.cab.unipd.it/o:469580 [accessed July 2024].

Results and discussion

Joseph Martin Neumayer – personal life

Joseph Martin Neumayer, the son of Joseph Neumayer and Eva Mayer, was born on 11 November 1791 in Peggau, nowadays a municipality in the district of Graz-Umgebung in the state of Styria, Austria. In the literature, Neumayer's name and even year of death have frequently been incorrectly reported due to scarce official sources (e.g. Braumüller 1853; Dietrich 1862; Lindemann 1885; Beck-Mannagetta 1901; Clementi 2017). Indeed, his given name is also reported as Franz or Giuseppe/Joseph, while 1842 instead of 1840 was cited as the year of death (Braumüller 1853; Clementi 2017; DDA-1840).

Neumayer studied medicine in Vienna, although he did not complete his degree (Petter 1843). He was a naturalist with broad interests: zoology, entomology, ornithology, and malacology (Carrara 1846; Braumüller 1853). During his medical studies he had taken a strong interest in botany and made use of the collections and literature of the Imperial Museum, where he also worked for some period. He arrived in Dalmatia, specifically in Dubrovnik, as a member of an expedition carried out in 1825 by the German entomologist Heinrich Kratter (Petter 1843), who was later a district physician in Słoszów on the Austrian-Russian border (Dohrn 1854; Marwinski 1981), nowadays on the border between Poland and Czechia.

Table 1. Contents of J.M. Neumayer's Letters to Professor R. Visiani from 1826 to 1840.

Letter No.	Date and Year of the Letter	Letter Contents	Research Area
1	1826–1827	List of 74 Plants (Visiani's Manuscript) Collected by Neumayer in the Vicinity of Dubrovnik, 1826–1827 („Elenco delle piante raccolte dal Friedrich[1] Neumayer nei contorni di Ragusa negli anni 1826 e 1827 e da me vedute")[2]	Dubrovnik
2	1828	List of 77 Plants Growing on Mount Biokovo, Signed on February 21, 1828; with a Marking of +15 Plants Found on August 1, 1828 („Lista di piante crescenti sul monte Biokovo, alcune raccolte da Friedrich Neumayer")[3]	Mount Biokovo
3	1828	List of Collected Shells, a Total of 24 on the List – Refers to a Collection of 40 „Rare Dalmatian Shells" Offered to Scientists („Contiene elenco di conchiglie")[4]	Dalmatia, Dubrovnik
4	30 September 1829	Notification about the shipment of 260 plants collected for Visiani, collaboration with botanist Welden (received catalogue) and Aschlinger in Zadar. Subjects of interest include cryptogamic plants, *Graminaceae, Trifolium, Euphorbia*, and *Medicago* („Ragusa li 30 Ottobre 1829")[5]	Collected in the vicinity of Dubrovnik
5	June 6, 1830	Requesting a permit from Welden for the study of plants and insects in the malarial region of the Neretva River in July/August 1830, as well as the surrounding mountains. The insect collection for Visiani was completed. („Ragusa li 6. Giugno 1830")[6]	Planned mission to the Neretva Valley and surrounding hills in July/ August 1830
6	June 12, 1830	Mentions an ascent to a high mountain and the collection of rare plants such as *Anthyllis aurea* and *Serratula radiata*. A meeting with Welden in Dubrovnik, who informs him that Visiani mentioned him (Neumayer) in his treatise. Insect collection activities also noted („Ragusa li 12 Giugno 1830")[7]	Unknown locality
7	13 September 1831	Meeting with Visiani in Dubrovnik 20 months earlier (January 1829). Collecting for Visiani included 'butterflies (Lepidoptera), (Coleoptera), Hymenoptera, and Diptera, flies, wasps, grasshoppers (Saltarelle), Orthoptera.' Collected species included *Agrostis miliacea*, *Andropogon pubescens* (?), *Anthyllis aurea*, *Centaurea punctata*, *Dianthus racemosus*, *Seseli globiferum* and *S. tomentosum*, *Alyssum mutabile*, a species of the genus *Seseli*, and *Aster*. ("Ragusa li 13 Settembre 1831")[8]	The vicinity of Dubrovnik
8	26 July 1832	Requesting financial support for the agreed research in the Neretva region. ("li 26 Giugno 1832. Ragusa")[9]	Neretva (Fort Opus fortress)
9	7 August 1832	Gratitude for Visiani's funding of the fieldwork in the Neretva region (12 florins). Tommasini's withdrawal of financial support after five years of collaboration through Franz Petter ("Li 7 Agosto 1832 Ragusa")[10]	Neretva
10	9 August 1836	He is preparing for fieldwork in the Primorje and Ston regions, and then once again in the Neretva area, followed by Vrgorac and Mount Biokovo, continuing on to the coal mining areas between Sinj and Knin.Plant specimens are being sent through Dr. Doderlein, while the next shipment will be sent via Dr. Pezzoli. He reports on the approach of cholera to the Neretva Valley, spreading from Split. ("Li 9. Agosto 1836 Ragusa")[11]	Pelješac (Ston), Primorje, Neretva, Biokovo, mountains between Sinj and Knin
11	10 October 1836	Journey to the Neretva and Biokovo – in addition to botany, also 'observation of important zoological subjects,' but animals were already in winter hibernation, so insufficient data was collected: 'Except for one amphibian and one orthopteran, nothing new was brought.' The vegetation of the wetlands was still in bloom; familiar species as in 'other marshy regions of Hungary', such as *Artemisia maritima, Tamarix*. Expresses admiration for Biokovo, but does not find the plant species previously collected there by Portenschlag Ledermayer. The planned visit to the Čitluk valley was unsuccessful. Difficulties with fieldwork in the Neretva; plant specimens collected in Neretva were sent via physician Dr. Roko Pezzoli and student Francesco Pezzoli, and Dr. Doderlein. Interest of some specimens from Dr. Rubrizius's herbarium. ("Li 10 Ottobre 1836 Ragusa")[12]	Neretva (Metković and ancient Narona); Biokovo

Letter No.	Date and Year of the Letter	Letter Contents	Research Area
12	25 October 1836	A total of 206 species collected (without systematic order) from Biokovo in September are sent in two packages; the first via Francesco Pezzoli (a law student in Padua), and the second in December via physician Rocco Pezzoli. Requests access to the identified species, especially those rare for Dalmatia. Conveys the impatience of naturalist circles regarding the publication of Visiani's work *Flora Dalmatica* ("Li 25. Ott. 1836 Ragusa")[13]	Biokovo
13	15 February 1837	Sends a package of plants (prepared as herbarium specimens) via Dr. Pezzoli (the previously agreed second package), consisting of plants collected during August and September 1836 *(Graminaceae, Viola, Trifolium*). Requests species identification. Apologizes for not having had time to organize the specimens. Promises to send the exact localities and additional collected species at a later date. ("Ragusa li 15. Genaro 1837")[14]	Biokovo
14	4 November 1837	Preparations for a botanical expedition to the mountains of Montenegro (necessary equipment required); seeks, through Visiani, interested scientists and financial supporters for the endeavor. Offers for sale a herbarium collection, as well as collections of amphibians, insects, and shells. Plans to prepare and preserve fish specimens through taxidermy and embalming. ("Li 4 Nov. 1837. Ragusa")[15]	Turkish territory in the mountainous regions of Montenegro
15	2 February 1838	Neumayer is forced to sell his herbarium, as well as his collection of mosses and algae gathered in Austria. Since he lacks an appropriate reference book, he asks Visiani for assistance in identifying several species. ("Li 2 Gen. 1838")[16]	Various localities
16	27 October 1839	Sends part of his collections to Visiani through physician Kaznačić. During the summer of 1839, he visited remote mountainous regions of Montenegro, and in July also Krivošije, covering two districts whose vegetation he compares to that of the valleys in mountainous Germany. Physician Doderlein took Neumayer's shell collection for an exhibition. („Lettera da Neumayer a Visiani")[17]	Lastovo, Korčula, during the summer the mountains above Budva, Lastva, Krivošije
17	27 October 1839	List of Plants 'Neumayer 27 October 1839'. Visiani's manuscript with the list of plants provided by Neumayer. („Lista di piante ricevute [?] da Friedrich Neumayer nel 1839.")[18]	Unknown localities, Dubrovnik, mount Orjen
18	4 February 1840	Enthusiasm for the mountainous regions of Orjen; plans to relocate to Kotor (as a grammar school professor); a job in Zadar. Mentions Doderlein and Tommasini, to whom he had promised to send Lenturre and algae, but had not yet managed to do so. ("Li 4. Febbr. 1840")[19]	Kotor, mount Orjen
19	12 March 1840	Plans for further research in the Kotor district, the Dubrovnik islands, and the Cetina Valley; intentions to continue mineralogical studies in the Kotor area, and to carry out botanical research in parts of Montenegro he has not yet visited (Herceg Novi, Sasovići, Ubli, Stanjevići, Brajići, Budva). He asks Visiani to intervene with the provincial government to send him again into the field in the regions of Crnojevići and Patršovići. He sends plant specimens, along with an additional list, and appeals to Visiani to use his influence with the provincial government in Zadar to help secure him a position there. („Lettera da Neumayer a Visiani")[20]	Peninsula Pelješac (Sabioncello), mount Orjen
20	12 March 1840	Plants sent by Neumayer along with the letter dated 12 March 1840 „Piante spedite del Neumayer con lettera 12 Marzo 1840" Visiani's manuscript: 64 species.[21]	Peninsula Pelješac (Sabioncello), mount Orjen
21	17 March 1840	"Collected around 300 species and approximately 500 specimens." Plants sent by Neumayer with the letter dated 12 March 1840. List 1 of plants delivered on 12 March 1840.[22]	Peninsula Pelješac (Sabioncello), mount Orjen
22	22 May 1840	Report from a dangerous border area of Montenegro in 1839, with very limited time available, and research primarily of a mineralogical nature. Plans for a return visit to Krivošije with a military officer friend who would ensure the safety of the expedition in this unstable border region. Asks Visiani and Tommasini to provide financial support for the research, promising in return a quantity of new plant specimens. Sends Visiani live plants in containers. ("Li 22 Maggio 1840 Ragusa")[23]	Plan for Krivošije

Letter No.	Date and Year of the Letter	Letter Contents	Research Area
23	26 April, unknown year	Connections with Welden and Portenschlag. Sends a package with plants: 'One *Colchicum* (with narrow petals), *Colchicum autumnale* (rare), and *Colchicum montanum* (common in rocky areas), which bloom from November to February. A *Hedysarum* (very beautiful), which you consider a new species, grows near the Neretva.' Requests a position as a sanitary commissioner in the Neretva region in order to revisit it ("Li 26. Aprile Ragusa")[24]	Vicinity of Dubrovnik

1 An incorrect name was assigned to Neumayer in the archive, although the original document makes no mention of Friedrich Neumayer.
2 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:332122] (accessed July 2024).
3 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:332156] (accessed July 2024).
4 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469613] (accessed July 2024).
5 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469581] (accessed July 2024).
6 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469583] (accessed July 2024).
7 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469572] (accessed July 2024).
8 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469584] (accessed July 2024).
9 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469570] (accessed July 2024).
10 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469574] (accessed July 2024).
11 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469578] (accessed July 2024).
12 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469579] (accessed July 2024).
13 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469577] (accessed July 2024).
14 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469575] (accessed July 2024).
15 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469576] (accessed July 2024).
16 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469580] (accessed July 2024).
17 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:306286] (accessed July 2024).
18 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:332129] (accessed July 2024).
19 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:463240] (accessed July 2024).
20 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:306304] (accessed July 2024).
21 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469585] (accessed July 2024).
22 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:306304] (accessed July 2024).
23 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469573] (accessed July 2024).
24 Biblioteca dell'Orto Botanico - Ar.B.25. Available at: [https://phaidra.cab.unipd.it/o:469582] (accessed July 2024).

In 1835, Neumayer married Ana Matičević (1797–1861), from the village of Čibača near Dubrovnik. The family rented a house in the area close to the historic centre of Dubrovnik (I. Lazarević, pers. comm.). Since his official employment as a cadastral field surveyor for real-estate tax assessment was not sufficient to support his family, Neumayer also worked as a teacher of Latin and German at the Dubrovnik Gymnasium (Anonymous 1833; Hoppe and Fürnrohr 1841; Petter 1843; DDA-1840). Neumayer died on 18 September 1840 in the village of Kuna on the Pelješac peninsula, in the house of Gašpar Ostoja, from malaria (*febbre putrida*), which he contracted while surveying the marshy areas of the Neretva River delta (Petter 1843; DDA-1840). He was buried in the parish cemetery of the village of Kuna (DDA-1840).

The probate documents showed that Dubrovnik pharmacist Antun Drobac (1810–1882), an important figure in Croatian natural history, was particularly close to the Neumayer family. Antun Drobac is credited with the discovery of the insecticidal properties of Dalmatian pyrethrum (*Tanacetum cinerariifolium* (Trevir.) Sch. Bip.), introduced the use of ether as a surgical anesthetic in the Dubrovnik hospital in 1847, and founded the Dubrovnik Natural History Museum in 1872 (Kršinić 1988, 1989; Bačić 2001; Rusković Krištić 2012). Although Neumayer most probably collected plant material, shells, and insects also for Drobac, he never mentioned him

in his correspondence with Visiani. Upon Neumayer's death, Drobac was appointed, along with his widow, as special co-tutor of the household (25 September 1840), after having assisted the family even during Neumayer's lifetime (HR DSA -156, G.N. XLVIII/24). The court found that Neumayer had left debts amounting to 318 florins, primarily for basic living expenses such as rent, food, and clothing repairs. The appraised value of his natural history collection (*Storia naturale*) was insufficient to cover the family's outstanding debts.

As co-tutor to the family, Drobac clearly influenced the education of Neumayer's children. At the time of Neumayer's death, his six children were still minors: Paolo 14, Giovanni 12, Carlo 10, Luigi 8, Anna 5, Marietta 2 (HR DSA -156, G.N. XLVII-II/24). Neumayer's son Carlo (1831–1883), a surgeon, later served as councilor of the Dalmatian Vice-Regency and ultimately moved with his family to Zadar, where he died (Visković and Domanovac 1987). Based on the archival material preserved in the Dubrovnik State Archives, no data have been found concerning the lives of the other children (HR DSA -156, G.N. XLVIII/24).

Neumayer's network of contemporary collaborators and his correspondence with Visiani

Neumayer became interested in Dalmatian flora during his studies in Vienna, where he discussed it at the Imperial Cabinet with, as he wrote to Visiani, the "insightful botanist" Franz von Portenschlag-Ledermayer, who "suggested such an undertaking" (letter 26 April, year unknown, Table 1). Before collaborating with Visiani, Neumayer also discussed Dalmatian flora with Franz Ludwig von Welden (1780–1853), who visited him in Dubrovnik bringing a "catalogue of plants" (letters 30 September 1829 and 6 June 1830, Table 1). Neumayer referred to Welden as "his patron" unsurprisingly, as Welden was the civil and military governor of Dalmatia from 1848, and served as the military administrator (Petricioli 1996).

Neumayer collected plants for Welden and, according to correspondence (letter June 6, 1830, Table 1), sought Welden's permission to research in the malarial area of the Neretva River delta and in the surrounding mountains, which at the time were the border with the Ottoman Empire (letter 6 June 1830). In his text "Über die Vegetation von Dalmatiens", Welden (1836) wrote: "At that time, chance brought together several diligent flora researchers in this country… Mr. Neumayer, though not especially fortunate in life, is a diligent collector who has resided in Dubrovnik for a long time and has thoroughly explored its surroundings". Neumayer also collaborated with the Austrian botanist Andreas Alschinger (1791–1864) from Zadar, who sent him Visiani's work "Enumeratio plantarum in Dalmatia crescentium" (letter 30 September 1829, Table 1). Neumayer also sent plant specimens to Domenico Pappafava (1815–1899) in Zadar. According to Barbarić-Gaćina (2007), Pappafava's herbarium once contained around 10,000 species. Unfortunately, the collection was relocated several times, survived three wars, and was ultimately left with a greatly reduced number of specimens (Vujčić-Karlo et al. 2009). Our recent examination of Pappafava's collection in Zadar confirmed that 46 specimens donated by Neumayer have been preserved (Table 2). Most of this plant material was

collected in Dubrovnik and, interestingly, some specimens were never identified to species level. In addition to Visiani, Neumayer also sent plant specimens to Muzio de Tommasini in Trieste, who himself occasionally forwarded some of these samples to Visiani in Padua (letters 7 August 1832 and 4 February 1850, Table 1). Neumayer forwarded plant specimens via students from Dubrovnik who pursued their studies at the University of Padua. Neumayer and Joshep Rubrizius (?–1835) are also noted in contemporary journals for sending interesting plant specimens to Tommasini (Hoppe and Fürnrohr 1836). According to Pulević and Vincek (2004) and Pulević (2006), Neumayer was one of Visiani's most diligent and valuable correspondents.

Neumayer was an enthusiast who did not wish to charge for his services or to sell the natural history material he collected (Petter 1843). He regarded collaboration with prominent scientists such as Visiani as a privilege and an honor: "I am convinced that I cannot do more or better for our science than to place in your hands even the small contribution I have managed to make to botany. It would be selfish to accept payment for this small contribution, as you suggest. Later, you could provide me with specimens that I am missing from your Dalmatian herbarium" (letter to Visiani, 30 September 1829, Table 1). On the other hand, Neumayer requested financial support from esteemed botanists (Tommasini, Visiani) to explore new sites within Dalmatia and to collect plants both for himself and for the sponsor's collections (letters of 7 August 1832 and 4 February 1850, Table 1).

The central collaboration defining Neumayer's botanical activity was surely the one with Roberto Visiani. Their collaboration began in 1826 during Visiani's service as a physician in several Dalmatian towns (Kotor, Drniš, Budva) (Table 1; letter 12 June 1830; Clementi 2017). In a letter, Neumayer mentions learning from Welden that Visiani was offered a provincial physician position in Zadar and expresses joy that his merits were "finally being recognized in the homeland" (letter 12 July 1830). Actually, Neumayer was one of 23 botanists who assisted Visiani in collecting plants for "Flora Dalmatica" (Visiani 1842; Clementi 2017). Visiani described Neumayer as "excellent in his work, tireless in collecting, and very knowledgeable" in the flora of the Dubrovnik area (Visiani 1842). On the folder containing Neumayer's letters from Dubrovnik (20 letters and 4 appended lists; 3 lists of plants and 1 of shells), Visiani wrote: "Neumayer from Vienna, an industrious and intelligent collector of plants, shells and reptiles in Dubrovnik" (UNIPD 38/4.3 - Ar.B.25).

Neumayer consistently expressed admiration for Visiani and attachment to Dalmatian landscapes and flora. Despite difficult living conditions, he believed he could best achieve his botanical aspirations through Visiani: "With my own limited vision, I have understood the difficulties opposing the perfect realization of a "Flora Dalmatica", and therefore the love, that I have developed and nurtured for this Dalmatia (while enduring constant hardships here) and my inclination toward your good yet unfortunate country, do not allow me to wish for anyone but you to carry out the idea of such a comprehensive collection of Dalmatian plants; the honor of such an undertaking is long deservedly yours" (letter 26 April, year unknown, Table 1). He inquired almost constantly about the completion of Visiani's "Flora patria", with a certain pride in contributing to it.

Table 2. List of specimens in the Domenico Pappafava herbarium collection at the Natural History Department, National Museum Zadar.

4337	114	Seseli	elatum	Croatia	Dubrovnik	E Dalmatia pr Ragusa	Neumayer	gift	herbarium sheet	Pappafava herbarium
4395	165	Campanula	hybrida ß glabra	Croatia	Dalmacija	E Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
4406	176	Caucalis	leptophylla	Croatia	Dalmacija	E Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
4479	236	Sesleria	elongata	Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
4545	297	Orchis	pyramidalis	Austrija		In Austriae pratis montanis rarior. Prop. Haimburg Retro Dornbach. Carinth. Loibl. Sattniz. E Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
4670	412	Ruta	crithmifolia	Croatia	Dubrovnik	Dalmatia p. Ragusa	Neumayer	gift	herbarium sheet	Pappafava herbarium
5056	711	Veronica		Croatia	Dubrovnik	Ragusa	Neumayer	gift	herbarium sheet	Pappafava herbarium
5125	766	Dianthus		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
5187	826	Arenaria	grandiflora				Neumayer	gift	herbarium sheet	Pappafava herbarium
5268	904	Delphinium		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
5319	954	Serapias	cordigera	Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
5548	1169	empty		Croatia	Dalmacija	e Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
5574	1192	Campanula	Rapunculoides	Croatia	Dalmacija	E Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
5786	1404	Oenanthe	pimpinelloides	Croatia	Dubrovnik	E Dalmat. Ragus.	Neumayer	gift	herbarium sheet	Pappafava herbarium
6280	1810	Bromus	madritensis	Croatia	Dalmacija	In Dalmatiae herbidis	Neumayer	gift	herbarium sheet	Pappafava herbarium
6372	1884	Triticum	pinnatum	Croatia	Dalmacija	E Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
6409	1917	Gentiana	crispata	Croatia	Dubrovnik	Monte Sniesizza vicino a Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
6448	1949	Allium	oleraceum	Croatia	Dalmacija	E Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
6459	1960	Fritillaria	tenella	Croatia	Dubrovnik	Ragusa	Neumayer	gift	herbarium sheet	Pappafava herbarium
6591	2070	Mentha	pulegium	Croatia	Dubrovnik	Dubrovnik	Neumayer	gift	herbarium sheet	Pappafava herbarium
6633	2112	Aegilops		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
6637	2113	Aegilops	geniculata	Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
7012	2362	Galium	rubens	Croatia	Dubrovnik	Dubrovnik (Ragusa)	Neumayer	gift	herbarium sheet	Pappafava herbarium
7456	2597	Primula	suaveolens	Croatia	Dubrovnik	Ragusa	Neumayer	gift	herbarium sheet	Pappafava herbarium
8120	3018	Oxalis		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8240	3084	Phleum	echinatum	Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8253	3088	Crypsis	alopecuroides	Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium

8320	3129	Trifolium		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8321	3130	Ononis		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8322	3131	Lotus		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8324	3133	Astragalus		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8325	3134	Lathyrus	aphaca	Croatia	Dubrovnik	Rag.	Neymayer	gift	herbarium sheet	Pappafava herbarium
8520	3307	Thymus		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8662	3422	Cyperus	rotundus	Croatia	Dubrovnik	Ragusa	Neumayer	gift	herbarium sheet	Pappafava herbarium
8664	3424	Arenaria	Arduini	Croatia	Biokovo	Biokovo	Neymayer	gift	herbarium sheet	Pappafava herbarium
8863	3583	Arabis		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8877	3594	Arysarum	vulgare	Croatia	Dalmacija	E Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
8927	3629	Galium		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
8971	3651	Scilla	amoena	Croatia	Dubrovnik	m umbrosis montibus fl. ApriliRagusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
9132	3726	Triticum		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
9145	3729	Tritticum	ciliatum	Croatia	Dalmacija	E Dalmatia	Neumayer	gift	herbarium sheet	Pappafava herbarium
9158	3735	Triticum	caespilosum			E Dalmatiae sterilibus	Neumayer	gift	herbarium sheet	Pappafava herbarium
9204	3747	empty		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
9372	3870	Labiata		Croatia	Dubrovnik	Ragusa	Neymayer	gift	herbarium sheet	Pappafava herbarium
9465	3954	Bunium	pyrenaeum	Croatia	Dalmacija	E Dalmatia	Neymayer	gift	herbarium sheet	Pappafava herbarium

Letters show that Neumayer often lacked the literature to properly determine collected species, sending numbered specimens from his own herbarium to Visiani for identification. Petter (1843) noted that, due to limited resources, Neumayer owned only a few specialized books, yet "he himself was a living encyclopedia". Neumayer also used current literature of the time, requesting Sprengel's works, Persoon's books, or agrostography texts instead of Reichenbach's "Flora excursoria" (Reichenbach 1830). Joseph Martin Neumayer read in all European languages except Polish and Russian (letters 4 November 1837 and 12 March 1840, Table 1). His interests were broad; he twice requested books on fish preparation and preservation (4 November 1837, Table 1).

Collection of plants and contribution to knowledge the Dalmatian flora

Neumayer's botanical research focused primarily on phanerogamic species, particularly specimens of the families Poaceae, Fabaceae, and Euphorbiaceae, but also included cryptogams (letter 30 September 1829, Table 1).

By analyzing the correspondence and the origin of specimens collected by Neumayer housed in Visiani's herbarium collection "Flora Dalmatica", as well as the published records, we reconstructed the localities visited by Neumayer from which he sent specimens to Visiani. Neumayer conducted fieldwork from Split in the northwest to Budva in the southeast, including the Dalmatian islands (Fig. 1). More precisely, Neumayer collected plants in Dubrovnik, the coastal area of the Pelješac Peninsula, Biokovo, Montenegro, the islands of Lastovo and Korčula, and the Neretva River delta.

The majority of the specimens originate from the Neretva River delta, localities in the immediate vicinity of Dubrovnik, Mt Orjen, and several different sites within the Bay of Kotor. He was particularly fascinated by the Neretva Valley: "What you have heard and seen from "Flora Naroniana", even out of season, can give you a sense of the richness, diversity, and abundance of vegetation in these regions" (letter 6 June 1830, Table 1).

Analysis of the plant specimens housed in Visiani's collection shows that Neumayer collected most intensively in southern Dalmatia (Tables 3, 4, Fig. 4).

Neumayer collected plants across a wide range of habitats and sites, from sea level up to the highest ranges in Dalmatia (Mt. Biokovo, max. altitude 1,762 m). It should be noted that, in addition to Neumayer, Visiani visited Mt Biokovo himself several times (in 1824, 1828), followed by de Tommasini (1827), Biasoletto (1829), and others (Šolić 1983). In October 1836, Neumayer sent two parcels of plants collected on Biokovo: one containing 206 species via law student Francesco Pezzoli and the second in December via physician Rocco Pezzoli (letter 25 October 1836). In a previous letter, Neumayer had praised the flora of Mt. Biokovo: "But Biokovo! What a unique and special flora!" (letter 10 October 1836). In 1839, "a small part of the botanical collection from the Kotor district" was sent via physician Ivan August Kaznačić (letter 27 October 1839).

Neumayer conducted botanical surveys in Dubrovnik and its vicinity from the time he arrived in the town in 1825. Petter (1853) noted Neumayer's familiarity with the hilly and mountainous areas southeast of Dubrovnik, including Mt. Sniježnica (1234 m a.s.l.), Stravča (470 m), and Mt. Bjelotina (1125 m). Petter 1853 describes their joint expedition to "Jelenagora" (the position of this toponym remains still unknown) on 5 June 1826, detailing the journey by boat from Dubrovnik to Cavtat, reaching the Konavle region, and deciding to avoid Mt Sniježnica due to local advice. They explored "meadows with *Agrostemma coronaria*" (syn. *Silene coronaria* (L.) Clairv.), but the precise locality cannot be established from the available sources. *Silene coronaria*, a Eurasian herbaceous plant, has later been introduced as an ornamental or medicinal plant to many countries worldwide (e.g. Pliszko and Łazarski 2024). Neumayer provided the first documented record of the Balkan-Apennine species *Anthyllis weldeniana* Rchb. (= *A. vulneraria* subsp. *weldeniana*) for southern Dalmatia. During this expedition, Neumayer's put his skill as a physician into practice by treating a sprained ankle, thus enabling the group to continue their descent, and recorded the harsh living conditions and dangers, including the presence of vipers.

Table 3. The specimens collected by Neumayer are housed in Roberto Visiani's herbarium Flora Dalmatica (PAD).

Package no.	Taxon (originally written)	Origin collection locality, described on label	Current valid taxon name	HERB. PATAV. (PAD)	Flora Dalmatica (vols)	Current status in Croatia	Note
1	*Chara hispida*		*Chara hispida* L.*	HD00026			
	Carex ampullacea	circa Narenta	*Carex rostrata* Stokes	HD00159	3	VU	
	Carex arenaria **L.**	circa Ragusa	*Carex arenaria* L.	HD00160	3		Rare in Croatia
	Carex glauca	Scoglio dirimpetto alla Badia	*Carex flacca* Schreb. subsp. *flacca*	HD00225			
	Carex hordeistechos	circa Narenta	*Carex hordeistichos* Vill.	HD00250	3	DD	
	Eriophorum angustifolium	Narenta	*Eriophorum angustifolium* Honck.	HD00344	3	CR	
	Scirpus maritimus		*Bolboschoenus maritimus* (L.) Palla	HD00385		NT	
2	*Calamagrostis montana*	circa Ragusa	*Calamagrostis varia* (Schrad.) Host; *Calamagrostis arundinacea* (L.) Roth	HD00587	3		
	Crypsis aculeata	Narenta	*Sporobolus aculeatus* (L.) P.M.Peterson	HD00589	1		
	Festuca pumila	montis Orien	*Festuca pumila* Chaix	HD00651		DD	Rare in Croatia (as *F. quadriflora* Honck, *sensu* FCD)
3	*Lolium temulentum speciosum*		*Lolium temulentum* L. [=*L. temulentum* subsp. *speciosum* (M. Bieb.) Arcang]	HD00758			
	Lolium rigidum	Perzagno, Cattaro	*Lolium rigidum* Gaudin	HD00749	Visiani Suppl. p. 22.		
	Lolium rigidum ß ?	Perzagno, Cattaro	*Lolium rigidum* Gaudin	HD00750			
4	*Panicum eruciforme*	Ragusa	*Moorochloa eruciformis* (Sm.) Veldkamp	HD00793	1		Rare in Croatia
	Phleum alpinum		*Phleum alpinum* L.	HD00813	3	DD	Rare in Croatia
5	*Narcissus polyanthos*	Scogli di Lesina	*Narcissus papyraceus* subsp. *polyanthos* (Loisel.) Asch. & Graebn.	HD01229			Very rare in Croatia
6	*Allium rotundum*	Ragusa	*Allium rotundum* L.	HD01298			
7	*Limodorum abortivum*	Cattaro	*Limodorum abortivum* (L.) Sw.	HD01577			
	Platanthera bifolia ß chlorantha		*Platanthera chlorantha* (Custer) Rchb.	HD01767		NT	.
	Platanthera bifolia		*Platanthera bifolia* (L.) Rich.	HD01768		VU	.
	Orchis bifolia		*Platanthera bifolia* (L.) Rich.	HD01769		VU	.
	Serapias lingua	Cattaro	*Serapias lingua* L.	HD01778			
	Serapias lingua	Cattaro	*Serapias lingua* L.	HD01782			
8	*Potamogeton lucens*	Narenta	*Potamogeton lucens* L.	HD01908			
	Ephedra distachya	Torreta, Spalato	*Ephedra distachya* L.	HD02030			Rare in Croatia
	Ephedra distachya		*Ephedra distachya* L.	HD02032			
9	*Salix aurita (syn. Salix caprea)*		*Salix aurita* L.	HD01867			
	Salix cinerea	in aquosis circa Narenta	*Salix cinerea* L.	HD01872	1		

Package no.	Taxon (originally written)	Origin collection locality, described on label	Current valid taxon name	HERB. PATAV. (PAD)	Flora Dalmatica (vols)	Current status in Croatia	Note
10	*Rumex tuberosus*	oliorumque circa Ragusa	*Rumex tuberosus* L.	HD02174			
	Atriplex patula		*Atriplex patula* L.	HD02185			
	Atriplex portulacoides		*Atriplex portulacoides* L.	HD02193			
	Chenopodium maritimum	Gravosa	*Suaeda maritima* (L.) Dumort.	HD02194		VU	
	Camphorosoma monspeliaca		*Camphorosma monspeliaca* L.	HD02203			
11	*Statice cosyrensis*		*Limonium dictyophorum* (Tausch) Degen	HD02384		NT	
	Statice articulata		*Limonium articulatum* (Loisel.) Kuntze	HD02385	2		Not distributed in Croatia (Sardinia, Italy)
	Statice oleifolia	Spalato et Ragusa	*Limonium virgatum* (Willd.) Fourr.	HD02411		DD	
	Statice oleifolia	Prapratno	*Limonium virgatum* (Willd.) Fourr.	HD02414		DD	
13	*Centaurea incompta*	Narenta	*Centaurea incompta* Vis.	HD02651	2	NT	Noted as *Typus* on the label.
	Centaurea incompta	Naretnta	*Centaurea incompta* Vis.	HD02652	2	NT	
	Centaurea jacea	Narenta	*Centaurea jacea* L.	HD02655			
	Centaurea jacea g pratensis	Narenta	*Centaurea jacea* L.	HD02659			
	Echinops neumayeri	Orien	*Echinops spinosissimus* Turra subsp. *neumayeri* (Vis.) Kožuharov	HD02730	2		Very rare in Croatia (Dubrovnik region)
	Echinops ritro b elegans	in montibus Ragusini	*Echinops ritro* L. ssp. *ritro*	HD02736	Visiani Suppl. p. 52.		
	Xeranthemum inapertum	Ragusa	*Xeranthemum inapertum* (L.) Mill.	HD02739			
14	*Carduus bicolor*	Dalmatia, sine loci specialis indicatione communicavit Neumayer	*Carduus acicularis* Bertol.	HD02778	2		
	Carduus carlinaefolius	in montibus ad Narenta	*Carduus defloratus* subsp. *carlinifolius* (Lam.) Ces.	HD02793			Not yet recorded for Croatia (*sensu* FCD)
	Carduus chrysacanthus forma pumila		*Carduus chrysacanthus* Ten.	HD02795			
15	*Galatella cana*		*Galatella cana* (Waldst. & Kit.) Nees	?	2		*Aster canus* Waldst. & Kit. is not distributed in Croatia (*sensu* FCD)
	Gnaphalium leontopodium	Orien	*Leontopodium nivale* subsp. *alpinum* (Cass.) Greuter	HD02966	2		
	Gnaphalium luteo-album	circa Ragusa	*Pseudognaphalium luteoalbum* (L.) Hilliard & B.L.Burtt	HD02967	2		
	Gnaphalium uliginosum	in inundatis udis circa Narenta	*Gnaphalium uliginosum* L.	HD02980	2		
	Pulicaria vulgaris		*Pulicaria vulgaris* Gaertn.	HD03060			
	Reichardia macrophylla	Orien	*Reichardia macrophylla* Vis. & Pančić	HD03060			

Package no.	Taxon (originally written)	Origin collection locality, described on label	Current valid taxon name	HERB. PATAV. (PAD)	Flora Dalmatica (vols)	Current status in Croatia	Note
	Filago germanica	Ragusa	*Filago germanica* (L.) Huds.	HD02943	Visiani Suppl. p. 61		as F.g. var. *eriocephala*
16	*Chrysanthemum leucanthemum b laciniatum*	in pratis et pascuis Ragusa	*Leucanthemum vulgare* Lam.	HD03326			*L. laciniatum* Huter, Porta & Rigo occurs in France and Italy
	Matricaria chamomilla		*Matricaria chamomilla* L.	HD03345			
17	*Rhagadiolus stellatus*		*Rhagadiolus stellatus* (L.) Gaertn.	HD03456			
	Urospermum picroides		*Urospermum picroides* (L.) Scop. ex F.W.Schmidt	HD03534			
18	*Hieracium praealtum*		*Pilosella piloselloides* subsp. *praealta* (Gochnat) S.Bräut. & Greuter	HD03728			
19	*Campanula ramosissima*	in pratis et pascuis, Cattaro	*Campanula ramosissima* Sm.	HD03728			
	Utricularia vulgaris	in aquis stagnantibus circa Narenta	*Utricularia vulgaris* L.	HD04155	2		
20	*Verbascum phlomoides*	in sterilibus, ruderatis, et ad muros hortorum circa Ragusa	*Verbascum phlomoides* L.	HD04381			
21	*Scutellaria alpina*	in praeruptis rupestribus jugi Troglav montis Biokovo	*Scutellaria alpina* L.	HD04941	2		
	Scutellaria alpina	in praeruptis rupestribus jugi Troglav montis Biokovo	*Scutellaria alpina* L.	HD04943	2		
	Stachys palustris	in paludosis ad Narenta	*Stachys palustris* L.	HD04999			
23	*Solanum dulcamara*	circa Ragusa ad rivos	*Solanum dulcamara* L.	HD05579			
25	*Periploca graeca*	in locis udis ad fruticeta circa Narenta	*Periploca graeca* L.	HD05865	3	EN	
	Asperula arvensis		*Asperula arvensis* L.	HD05894			
	Lonicera glutinosa	in petrosis summi verticis montis Orien supra Risano	*Lonicera alpigena* subsp. *glutinosa* (Vis.) Kit Tan & Ziel.	HD06062	3	Endemic	
27	*Laserpitium siler*		*Siler montanum* Crantz	HD06358			
	Ligusticum seguieri	Orien	*Ligusticum lucidum* Mill.	HD06372	3		
	Prangos ferulacea	in montibus circa Ragusam	*Prangos ferulacea* (L.) Lindl.	HD06456, HD06457, HD06458			This is the only locality recorded in Croatia to date
28	*Sium latifolium*	in aquosis circa Metkovich	*Sium latifolium* L.	HD06503, HD06504			
29	*Ranunculus flammula*	Narenta	*Ranunculus flammula* L.	HD06712	3		
31	*Lepidium graminifolium*	in ruderatis et viis ubique locorum obvium	*Lepidium graminifolium* L.	HD07392			

Package no.	Taxon (originally written)	Origin collection locality, described on label	Current valid taxon name	HERB. PATAV. (PAD)	Flora Dalmatica (vols)	Current status in Croatia	Note
	Matthiola glandulosa	Budua	*Matthiola sinuata* (L.) W.T.Aiton	HD07413			
32	*Mesembryanthemum crystallinum*	in Dalmatia et probiliter circa Ragusa	*Mesembryanthemum crystallinum* L.	HD07558	3		
	Polycarpon alsinefolium	Ragusa	*Polycarpon alsinifolium* (Biv.) DC.	HD07752			
33	*Sedum olympicum*	Orien	*Sedum magellense* Ten.	HD05371	3		
	Sempervivum hirtum	in Dalm	*Sempervivum globiferum* subsp. *hirtum* (L.) 't Hart & Bleij	HD05411	3		
34	*Saxifraga cotyledon*	in Dalmat. orient.	*Saxifraga cotyledon* L.	HD07934	3		Not occurs in Croatia (*sensu* POWO)
	Malva nicaeensis obtusata	Ragusa	*Malva nicaeensis* All.	HD08118			*M. obtusata* (=*M. pusilla* Sm.)
	Malva thuringiaca	Ragusa	*Malva thuringiaca* (L.) Vis.	HD08128	3		
36	*Potentilla speciosa*	Orien	*Potentilla speciosa* Willd.	HD08628	3		
37	*Cytisus sericeus*		*Genista sericea* Wulfen	HD08895		Endemic	
39	*Medicago praecox*	Prapratno, Ragusa	*Medicago praecox* DC.	HD09238	3		This is the only locality recorded in Croatia to date
	Ononis brachystachya	In pratis humidis, Ombla, circa Ragusa	*Ononis spinosa* L. subsp. *procurrens* (Wallr.) Briq.	HD09336	3		
	Ononis columnae	In apricis	*Ononis pusilla* L. subsp. *pusilla*	HD09342			
40	*Trifolium patens*		*Trifolium patens* Schreb.	HD09554			
	Vicia dumetorum	In… agri Ragusini	*Vicia dumetorum* L.	HD09714	3		
	Trifolium patulum	Vlastiza	*Trifolium patulum* Tausch	HG09557	3		Rare in Croatia
	Trifolium patulum	In umbrosis castancarum sylvae Stolivo	*Trifolium patulum* Tausch	HD09558	3		Rare in Croatia

Package numbers and its content in the Visiani's herbarium Flora Dalmatica.
[1] = Flora Dalmatica 1: Cryptogamae, Cyperoideae; [2] = Flora Dalmatica 2: Gramineae A-F; [3] = Flora Dalmatica II, Gramineae G-R; [4] = Flora Dalmatica II: Graminaae S-V; [5] = Flora Dalmatica 3: Juncaceae, Irideae, Amaryllideae; [6] = Flora Dalmatica 3: Liliaceae; [7] = Flora Dalmatica 4: Colchiaceae, Smilacaceae, Dioscoreae, Orchideae, Callaceae, Thyphaceae, Lemnaceae; [8] = Flora Dalmatica 4: Najadeae, Alismaceae, Butomae, Hydrocharideae, Asarineae, Cytinae, Numyphaceae, Coniferae; [9] = Flora Dalmatica 5: Amentaceae, Salicineae, Juglandeae; [10] = Flora Dalmatica 6: Urticaceae, Santalaceae, Laurineae, Polygoneae, Phytolaccaceae, Chenopodiaceae, Amaranthaceae, Scleranthеae; [11] = Flora Dalmatica 7: Plantagineae, Plumbagineae, Globulariaceae; [13] = Flora Dalmatica 8: Compositae A-CARD; [14] = Flora Dalmatica 9: Compositae, CARL.-CH.; [15] = Flora Dalmatica 10: Compositae CI-G; [16] = Flora Dalmatica 10: Compositae, H; [17] = Flora Dalmatica 11: Compositae IN.-PUL.; [18] = Flora Dalmatica 12: Compositae, R-Z; [19] = Flora Dalmatica 13: Amvrosiaceae, Campanulaceae, Vaccinieae, Ericeae, Styracaceae, Ebenaceae, Santolinae, Primulaceae, Lentibulariae; [20] = Flora Dalmatica 14: Scrophulariaceae A-Verbascum; [21] = Flora Dalmatica 16: Labiatae M-S; [23] = Flora Dalmatica 17: Labiatae T-Z, Achanthaceae, Convolvulaceae, Cuscutaceae, Solaneae; [25] = Flora Dalmatica 19: Gentianeae, Asclepiadeae, Apocyneae, Rubiaceae, Caprifoliaceae, Jasmineae, Oleineae, Loranthaceae; [27] = Flora Dalmatica ?: Umbellatae; [28] = Flora Dalmatica 22: Umbellatae R-Z, Ranunculaceae A; [29] = Flora Dalmatica 23: Ranunculaceae A B-Z, Droseraceae, Polygaleae, Resedaceae, Fumariaceae, Papaveraceae; [31] = Flora Dalmatica 25: Cruciferae F-Z; [32] = Flora Dalmatica 26: Capparideae, Cucurbitaceae, Grossularieae, Cactoideae, Mesembryanthemeae, Cistineae, Violarieae, Tamariscineae, Hypericineae, Paronychiceae, Portulaceae, Frankeniaceae, Caryphylleae A-C; [33] = Flora Dalmatica 27: Caryophylleae D-Z, Crassulaceae; [34] = unreadable; [36] = Flora Dalmatica 30: Rosaceae, Pomaceae, Dryadeae, Spiraeaceae, Amygdaleae; [37] = Flora Dalmatica 31: Leguminosae A-C; [39] = Flora Dalmatica 33: Leguminosae M-P; [40] = Flora Dalmatica 34: Leguminosae S-Z.

In general, field research was extremely difficult, costly, and dangerous. In a letter dated 6 June 1830 Neumayer notes the malarial risks of the Neretva marshes (Table 1) which he later visited in August 1832 with funding from a patron and additional 12 florins from Visiani. After five years of support, de Tommasini could no longer finance the expedition (letter of 7 August 1832). During his expeditions to Pelješac, Primorje and Mt Biokovo in 1836 Neumayer passed through Neretva valley, and noted the cholera epidemic and dependence on local guides, noting losses of materials due to negligent assistants (letters 9 August 1836; 10 October 1836). Fieldwork costs included herbarium paper, maps, boxes, tools, guns, ammunition, anatomical instruments, and clothing (letter 4 November 1837).

After Neretva Neumayer explored Montenegro's mountainous regions (according to letters in 1837, 1839, 1840, Table 1), then Ottoman borderlands, praising the area as among the richest in Europe for natural history, with diverse landscapes, from high peaks to fertile plains and marshes (letter 4 November 1837). Beck-Mannagetta (1901) in Die "Vegetation der Erde: Sammlung pflanzengeographischer Monographien, volume IV" presented a survey of botanical investigations along the Easter Adriatic coast, including Dalmatia, and referred to Neumayer's first visit to mountain region Krivošije in Montenegro in 1825. However, it should be noted that coastal part of present-day Montenegro then belonged to Dalmatia, and Montenegro itself had no access to the sea. He first ascended Mt Orjen in 1839. Neumayer collected specimens there, on the basis of which Visiani later described seven taxa new to science: 1) *Amphoricarpos neumayeri* Vis. and *Jurinea neumayeriana* Vis. [according to POWO (2024): *Amphoricarpos neumayerianus* (Vis.) Greuter)]; 2) *Carduus bicolor* Vis. [*Carduus acicularis* Bertol.]; 3) *Achillea abrotanoides* Vis.; 4) *Lonicera glutinosa* Vis. [*Lonicera alpigena* sub. *glutinosa* (Vis.) Kit Tan et. Ziel]; 5) *Iberis serrulata* Vis. [*Iberis sempervirens* L.]; 6) *Cytisus tommasinii* [*Chamaecytisus tommasinii* (Vis.) Rothm.]; and 7) *Avena neumayeriana* Vis. [*Danthoniastrum neumayerianum* (Vis.) Tzvelev]. In addition to above mentioned, Visiani honored Neumayer by naming four taxa after him; *Echinops neumayeri* Vis. [*Echinops spinosissimus* Turra subsp. *neumayeri* (Vis.) Kožuharov]; *Peucedanum neumayeri* (Vis.) Rchb.fil. [*Taeniopetalum arenarium* subsp. *neumayeri* (Vis.) Pimenov & Ostr.] collected in the vicinity of Dubrovnik, (Šilić 1984; Sánchez-Jiménez et al. 2012; Conti et al. 2020).

In a letter likely from the 26th of April 1839 or 1840, Neumayer expressed a strong desire to revisit the Neretva River delta, rich in entomological and ornithological diversity.

In his last known letter (12 March 1840, Table 1), he outlined plans to survey key localities in the Kotor district, the southernmost part of the then Kingdom of Dalmatia, including the settlements of Herceg Novi, Sasovići, Ubli, Stanjevići, Brajići, and the surroundings of Budva. The authorities in Vienna and Zadar were satisfied with his work (letter 4 February 1840, Table 1). Neumayer planned to survey the islands of Dubrovnik and the Cetina Canyon between Knin and Sinj. He also reported plans to return to the still unsafe Mt Orjen area near Krivošije, a vast karst plateau (c. 1000 m a.s.l.) on the eastern slopes of Mt Orjen, accompanied by an officer due to the risk of banditry. Neumayer also informed Visiani that he had sent three jars of living plants by steamer: "*Quassia* trees, about thirty crocus bulbs, five orchid taxa (one possibly new to science), as well as *Lolium subulatum* and *Stachys mentis*…exceptionally fragrant and delicate".

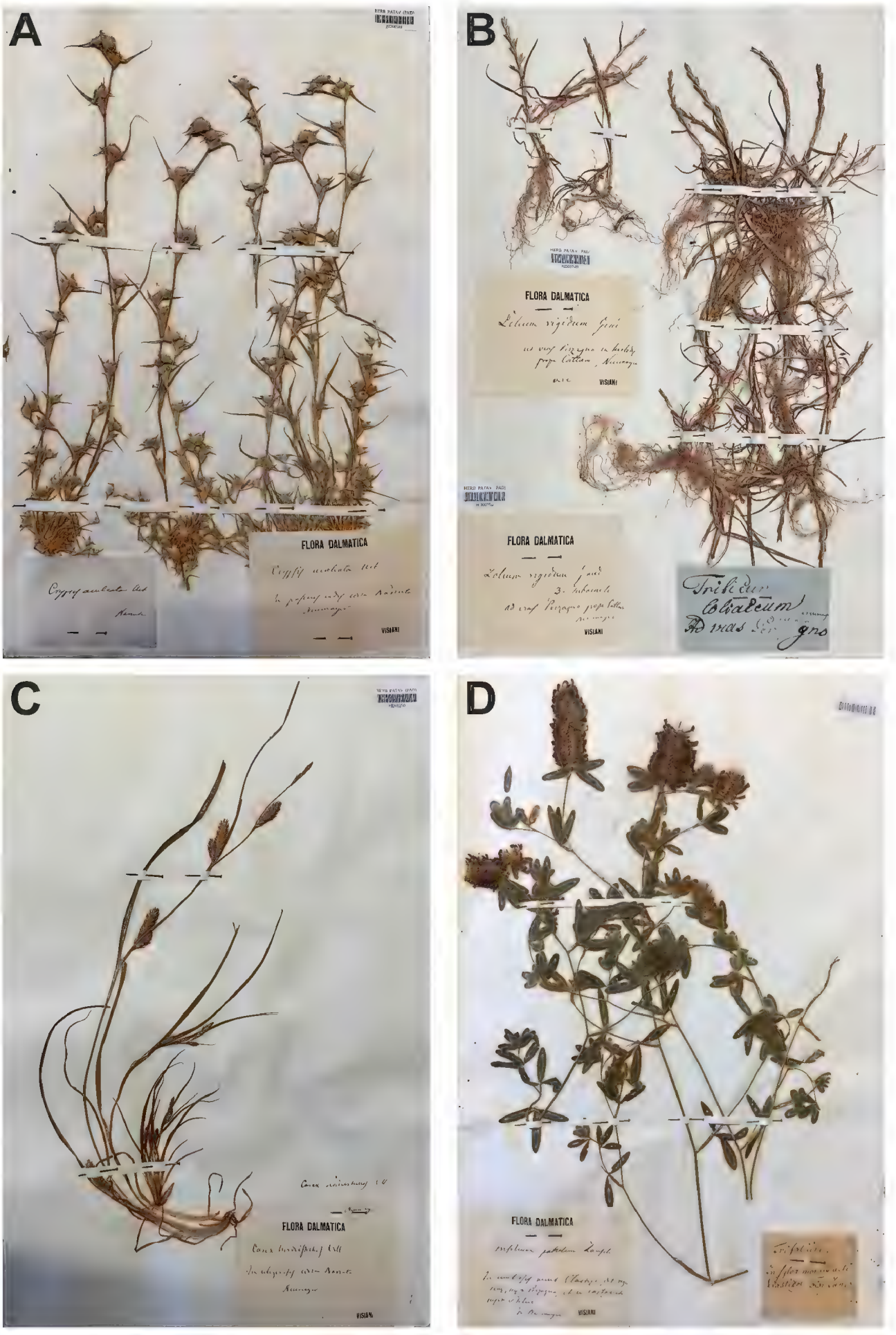

Figure 4. Herbarium sheets from "Flora Dalmatica" showing Neumayer as collector. **A** *Crypsis aculeata*, Narenta (Neretva delta) **B** *Lolium rigidum* (= *Triticum loliaceum*), Prčanj (Bay of Kotor) **C** *Carex hordeistichos*, Narenta **D** *Trifolium patulum*, Mt. Vlaštica near Dubrovnik (photo: M. Marić).

From the literature from the period, Neumayer is said to also have collaborated with Eduard Lindemann, whose collection kept in the Herbarium of the Botanical Department of St. Petersburg State University, Russia (Lindemann 1884, 1885; Byalt et al. 2008).

Status of species from today's perspective

In general, the available data on the specimens collected by Neumayer and preserved in Visiani's collection "Flora Dalmatica" provide at least partial insight into the composition of the flora in the first half of the 19th century (Tables 3, 4). Some of the species collected by Neumayer remain rare in the Croatian flora today (e.g. *Sporobolus aculeatus* (L.) P.M.Peterson, *Ephedra distachya* L., etc.). The presence of some the collected species (e.g. *Limonium articulatum* (Loisel.) Kuntze), native to Corsica (France) and Sardinia (Italy), in Croatia is now considered misidentifications. According to current taxonomic understanding, material previously assigned to *L. articulatum* should be referred to *L. cancellatum* group in Croatia (*sensu* Bogdanović and Brullo 2015). Certain specimens may have been incorrectly identified as *Centaurea incompta* Vis. and *Eriophorum angustifolium* Honck. from the Neretva River delta. *Centaurea incompta* requires warmer and drier karstic habitats, while *E. angustifolium* occurs on acidic and wet oligotrophic conditions in continental part of Croatia. It is unclear whether the misidentification was made by Visiani or by Neumayer. Other species (e.g. *Prangos ferulacea* (L.) Lindl.) have not been recorded in Croatia since Neumayer's time, even though the dry rocky habitats with xeric grasslands at higher elevations have generally undergone little change. In contrast, the Neretva River delta has experienced the most drastic habitat transformation over the past two centuries. By the mid-20th century, a significant proportion of its wetland habitats (ca. 80% of the area) had been lost due to various human activities, primarily land-reclamation projects (Jasprica et al. 2003, 2005).

In Visiani's works "Stirpium Dalmaticarum Specimen" (Visiani 1826) and "Florae Dalmaticae Supplementum Alterum", vol. 2 (Visiani 1877), no records associated with Neumayer are mentioned (Table 4). However, in "Flora Dalmatica" vols. 1, 2, and 3 (Visiani 1842, 1847, 1852), Neumayer is cited as a collector or sender of specimens 20, 18, and 47 times, respectively. The documentation also shows that the habitats from which Neumayer collected plants range from the low rocky coastal zone (e.g. *Limonium*) up to approximately 1600 (–1800) m a.s.l. (e.g. *Amphoricarpos*).

Neumayer's Legacy

Contemporary newspapers reported that Neumayer's family was left with "nothing but his collection of plants, reptiles, and molluscs" (Hoppe and Fürnrohr 1841). This is further confirmed by probate documents compiled shortly after his death (HR DSA-156, G.N. XLVIII/24). To evaluate the items in Neumayer's natural history collection ("Storia naturale"), as indicated in the probate file, local pharmacist Mato Šarić, who engaged in plant collecting himself, and municipal physician Roko Pezzoli were appointed, with Niccolo Giuricco as witness (HR DSA-156, G.N. XLVIII/24). Pezzoli concluded that it was very difficult to estimate the value of the botanical collection and the other items from Neumayer's "Storia naturale", and that proper assessment would require considerable time and resources. The entire inventory, according to Šarić and Pezzoli, had evidently not been fully determined and classified according to Linnaean system of binomial nomenclature.

Table 4. Neumayer's contribution to the works of Roberto Visiani (1826–1877).

No.	Taxon (originally written in works)	Locality / Habitat	Note
Stirpium Dalmaticarum Specimen (Visiani 1826)			
	No data of Neumayer is reported.		
Flora Dalmatica 1 (Visiani 1842)			
1	*Aspidium thelipteris* Sw.	locis palustribus prope Narenta	legit et misit egr. Neumayer
2	*Cheilanthes odora* Sw.	ad muros, et in fissuris saxorum insulae Giuppana, aliarumque ditionis Ragusinae	legit egr. Neumayer
3	*Cheilanthes fimbriata**	in murorum fissuris insulae Giuppana	legit egr. Neumayer praecedenti commixtam
4	*Panicum eruciforme* Sibth.	in graminosis Bergato prope Ragusa	Dom. Neumayer
5	*Crypsis schoenoides* Lam.	in pascuis udis et subsalsis circa Narenta	misit Neumayer
6	*Crypsis aculeata* Ait.	in pascuis udis circa Narenta	misit Neumayer
7	*Briza media* L.	in pratis humidis circa Narenta	D. Neumayer
8	*Lolium subulatum**	in satis circa Bergato prope Ragusa	D. Neumayer
9	*Lolium robustum* Reichb.	in pratis circa Narenta	D. Neumayer, apud quem siccam plantam vidi
10	*Crocus dalmaticus**	in ericetis apricis montis Bossanka in ditione Ragusina	legit Neumayer
11	*Narcissus Pseudo - Narcissus* L.	in lapidosis apricis ad Breno prope Ragusa	Fr. Neumayer
12	*Allium rotundum* L.	ad vineas et locis saxosis circa Ragusa, et in insula Giuppana	misit Neumayer
13	*Asparagus officinalis* L.	in pratis udis circa Stagno, et Narenta	legit Neumayer
14	*Orchis saccifera* Brongn.	in rupestribus Teodo prope Cattaro	invenit Neumayer
15	*Ophrys bombyliflora* Link.	in graminosis apricis Mulla prope Cattaro	misit Neumayer
16	*Epipactis microphylla* Sw.	Etiam e ditione Ragusina, sed sine loci specialis indicatione.	misit Neumayer
17	*Hydrocharis Morsus ranae* L.	in aquosis circa Narenta	Neumayer
18	*Quercus ilex* L.	Sabbioncello	misit Neumayer
19	*Salix cinerea* L.	in aquosis circa Narenta	misit Neumayer
20	*Polygonum dumetorum* L.	ad sepes circa Narenta	legit Neumayer
Flora Dalmatica 2 (Visiani 1847)			
21	*Plantago Weldeni* Rchb.	ad salinas prope Stagno	detexit F. Neumayer
22	*Statice articulata* Loisl.	in scopulosis maritimis circa Ragusa	legit Neumayer
23	*Cephalaria leucantha* Schrad.	in saxosis apricissimis circa Ragusa	legit Neumayer
24	*Echinops Neumayeri* Vis.	in Dalmatia, unde absque loci specialis indicatione, sed probabiliter ex Narenta	communicavit Fr. Neumayer
25	*Amphoricarpos Neumayeri* Vis.	in rupestribus sylvaticis elatioribus montis Orien (in Krivoscie supra Risano)	rarissimam plantam detexit Fr. Neumayer
26	*Centaurea incompta* Vis.	in pratis circa Narenta	legit Neumayer
27	*Carduus bicolor* Vis.	in Dalmatia , probabiliter tamen oritur in monte Orien	unde sine loci specialis indicatione communicavit Neumayer
28	*Galatella cana* Nees	in fruticetis sylvaticis montis Sniesniza prope Ragusa	legit Neumayer
29	*Senecio Visianianus* Papaf.	in umbrosis elatioribus montium Montenegro, ubi eum detexit egregius patriae Florae scrutator Doct. Dominicus Papafava, mihique inscripsit, et montis Orien	misit b. m. Neumayer
30	*Gnaphalium uliginosum* L.	in inundatis udis circa Narenta	misit Neumayer
31	*Gnaphalium Leontopodium* L.	in pascuis apricis montis Orien	legit Neumayer
32	*Anthemis austriaca* Jacq.	in apricis agrestibus circa Narenta	misit Neumayer
33	*Anthemis chia* L.	frequens ad vias et in ruderatis circa Ragusa	misit Neumayer
34	*Achillea abrotanoides* Vis.	in apricis rupestribus montis Orien in Krivoscie ad alt . 5000 ped.	invenit Neumayer

No.	Taxon (originally written in works)	Locality / Habitat	Note
35	*Picridium vulgare* Desf.	in apricis saxosis, et herbidis totius Dalmatiae, var. *scapigerum* in rupium fissuris montis Orien	legit Neumayer
36	*Utricularia vulgaris* L.	in aquis stagnantibus circa Narenta	legit Fr. Neumayer
37	*Scutellária alpina* L.	in praeruptis rupestribus jugi Troglav montis Biokovo	legit Fr. Neumayer
38	*Chrysanthemum corymbosum* L.		ex herbario Neumayeri speciem aliam huic proximam
Flora Dalmatica 3 (Visiani 1852)			
39	*Taeniopetalum Neumayeri* Vis.	in vineis rupestribus insulae Jaklian prope Ragusa	primo misit Fr. Neumayer
40	*Periploca graeca* L.	in locis udis ad fruticeta circa Narenta	primum invenit Neumayer
41	*Adòxa Moschatellina* L.	in nemorosis umbrosis montium Ragusinorum	legit Fr. Neumayer
42	*Lonicera glutinosa* Vis .	in petrosis summi verticis montis Orien supra Risano	legit aestate fructiferam Fr. Neumayer
43	*Ligusticum Seguierii* Koch.	in petrosis apricis montis Orien	misit Neumayer
44	*Thalictrum aquilegifolium* L.	var. *iisdem* locis in montibus Pastrovich	legit Neumayer
45	*Ranunculus Flammula* L.	in palustribus circa Narenta	legit Neumayer
46	*Iberis serrulata* Vis.	in petrosis apricis montis Orien	legit mense Augusto fructiferam Fr. Neumayer
47	*Sisymbrium Irio* L.	ad vias et agrorum margines circa Ragusa	legit Fr. Neumayer
48	*Mesembryanthemum crystallinum* L.	in Dalmatia, et probabiliter circa Ragusa	sine loci specialis indicatione misit Neumayer
49	*Tamarix gallica* L.	in palustribus Fort'Opus et ad ripas fluvii Narenta	legit Neumayer
50	*Gypsophila scorzoneraefolia* Desf.	in Dalmatia orientali	sine loci specialis notitia misit Neumayer
51	*Sedum olympicum* Boiss .	in rupestribus montis Orien rarissimum	invenit Fr. Neumayer
52	*Sempervivum hirtum* L.	in Dalmatia orientali	sine loci specialis indicatione habui a Neumayer
53	*Saxifraga Cotyledon* L.	in montibus Dalmatiae orientalis	sine loci specialis indicatione legit Neumayer
54	*Myrtus tarentina* Bertol.	in scopulo Lapad prope Ragusa	legit Fr. Neumayer
55	*Malva thuringiaca* Vis.	in locis saxosis incultis circa Ragusa	legit Neumayer
56	*Malva Cyrilli* Vis.	ad sepes et vineas ad Bossanka et Bergato circa Ragusam	legit Neumayer cum praecedente
57	*Geranium pratense* L.	in Dalmatia orientali	sine loci specialis indicatione misit Neumayer
58	*Euphorbia pilosa* L.	ad paludes maritimas et rivulos circa Stagno	legit Neumayer
59	*Potentilla speciosa* W.	in fissuris rupium montis Orien alt. 5000 ped.	legit Fr. Neumayer
60	*Cytisus Tommasinii* Vis.	in sylvaticis montium Krivoscie supra Risano, in Monte di Pastrovichio, in collibus ultra Castel Lastva	supra Stòlivo: egr. Fr. Neumayer
61	*Cytisus Villarsii* Vis .	in apricis asperis montis Zevelin Dalmatiam ab Herzegovina (J.Clementi)	in aridis petrosis montium Ragusinorum, misit Neumayer
62	*Ononis brachystachya* Vis .	in sylvaticis umbrosis montium Ossoniak et in pratis humidis Ombla prope Ragusa	legit Fr. Neumayer
63	*Anthyllis aurea* Vis.	in summo vertice montium Sniesniza et Vlastiza ditionis Ragusinae	invenit Fr. Neumayer
64	*Medicago praecox* DC .	in arvis et collibus circa Ragusam	legit Fr. Neumayer
65	*Medicago carstiensis* Jacq.	in graminosis circa Ragusa	legit Fr. Neumayer
66	*Trifolium patulum* Tausch	in umbrosis sylvaticis montis Vlàstiza in ditione ragusina, nec non supra Perzagno, et in castaneto supra Stolivo in Canale di Cattaro	legit Fr. Neumayer

No.	Taxon (originally written in works)	Locality / Habitat	Note
67	*Trifolium Pignantii* Fauché & Chaub.	in castanetis umbrosis supra Stòlivo et Perzagno	legit Fr. Neumayer
68	*Vicia dumetorum* L.	in dumetis montanis ditionis Ragusinae	habeo in herb. dalmatico Fr. Neumayer sine loci specialis indicatione
69	*Vicia altissima* Desf.	in dumetis montosis Dalmatiae orientalis, et probabiliter ditionis ragusinae	herbario dalmatico Fr. Neumayer sine loci specialis notitia
70	*Grammitis leptophylla* Sw.	ad muros et rupes agri Ragusini	legit Fr. Neumayer
71	*Calamagrostis montana* Host	in montosis circa Ragusa	legit Fr. Neumayer
72	*Milium paradoxum* L.	in sylvaticis umbrosis agri Ragusini	legit Fr. Neumayer
73	*Phleum alpinum* L.	in montibus elatioribus ragusinis	sine loci specialis notitia legit Fr. Neumayer
74	*Avena Neumayeriana* Vis.	in graminosis apricis rupestribus montis Orien	invenit Fr. Neumayer
75	*Poa pilosa* L.	in cultis et ad vias ditionis Ragusinae	legit Neumayer
76	*Nardus stricta* L.	in locis montanis agri Ragusini	legit Fr. Neumayer
77	*Carex remota* L.	in locis umbrosis udis ditionis Ragusinae	legit Fr. Neumayer
78	*Carex leporina* L.	in pascuis agri Ragusini	legit Neumayer
79	*Carex arenaria* L.	in herbidis et ad vias ditionis Ragusinae	legit Fr. Neumayer
80	*Carex hordeistichos* VILL.	in uliginosis circa Narenta	legit Fr. Neumayer
81	*Carex ampullacea* Gooden	in locis paludosis circa Narenta	legit Fr. Neumayer
82	*Eriophorum angustifolium* Roth	in pratis udis circa Narenta	legit Fr. Neumayer
83	*Orchis albida* Scop.	in graminosis montanis ditionis Ragusinae	misit Fr. Neumayer
84	*Goodyera repens* R. Br.	in sylvaticis montanis ditionis Ragusinae	misit Fr. Neumayer
85	*Drosera longifolia* L.	in paludosis circa Narenta	legit Fr. Neumayer; Current regionally extinct (RE) taxon in Croatia
Florae dalmaticae supplementum / opus suum novis curis castigante et augente Roberto Visiani (Visiani 1872)			
86	*Agrostis alpina* Scop.	in saxosis herbidis montis Orjen	legit Fr. Neumayer, Vol. 1, p. 6
87	*Lolium rigidum* Guad.	in herbidis secus vias ad Perçanjo in Canale di Cattaro	legit Fr. Neumayer, Vol. 1, p. 50–51
88	*Echinops ritro b elegans*	fl. dalm. lectus a Neumayero in collibus ragusinis	Vol. 2, p. 26
89	*Filago germanica* var. *eriocephala*	lectus a Neumayero in collibus Ragusinis	Vol. 2, p. 75
90	*Cichorium Intybus b indivisum*	fl. dalm. lectum fruit circa Ragusa a Neumayer	Vol. 2, p. 97
91	*Salavia offinicnalis* var. *g auriculatum*	In monte Shaba et aliis locis ditionis Ragusinae Neumayer	Vol. 2, p. 186–187
92	*Euclidium syriacum* R. Br.	In herbario dalmatico Fr. Neumayer nunc meo invenitur sine loci specialis notitia	Vol. 3, p. 106
93	*Cardamine carnosa* W. Kit.	in saxosis rupestribus in summis jugis mont. Vellebit ad Malovan, et Orien	Vol. 3, p. 128
94	*Sedum magellense* Ten. (syn. *Sedum olympicum* Boiss .)	in saxosis apricis montis Orien ubi legere Neumayer, Pichler et Maly	Vol. 3, p. 187
Florae dalmaticae supplementum alterum - vol. 2. Adjectis plantis in Bosnia, Hercegovina et Montenegro crescentibus (Visiani 1877)			
	No data of Neumayer is reported.		

For this reason, eight months later (15 June 1841), the court of first instance assessed the collection solely on the basis of the specimens that had already been classified. Following the expert evaluation by Šarić and Pezzoli, its value was estimated at 95 florins. According to the probate inventory, Neumayer's estate included 33 volumes. The natural history items comprised: (1) a herbarium of 43 sheets with numerous fully identified plant

specimens collected in the surroundings of Dubrovnik and Kotor (valued at 70 florins); (2) a collection of terrestrial and marine shells comprising approximately 90 species (20 florins); (3) several mineral specimens (2 florins); (4) several dried snakes (1 florin); (5) an insect collection in poor condition (2 florins); and (6) a bundle of catalogues of unclassified material, to which no value was assigned. From today's perspective, it is difficult to assess precisely the material value of Neumayer's estate; for comparison, the monthly salary of stable groom in the mid-19th century amounted 40 florins (until 1857, one florin equalled 60 kreuzers; after 1857, one florin equalled 100 kreuzers) (Marić 2024).

Croatian historian and archaeologist Frano Carrara (1812–1854) wrote in his travelogue "La Dalmazia descritta" (Carrara 1846) that "thanks to Neumayer's tireless research work, almost all bird species in Dalmatia are now known", that he contributed to the study of reptiles, and that the bird collection of the late Neumayer had been purchased by the Austrian army officer and naturalist Christoph Freiherr Fellner von Feldegg (1779–1845). However, Carrara does not mention the date or year of the sale (Carrara 1846). According to the probate records, these birds were not part of the estate inventory.

Neumayer was sending bird specimens from the Dubrovnik region to naturalists in Vienna as early as 1826 (Carrara 1846). The species *Sitta neumayer* Michahelles, 1830 (Western Rock Nuthatch) was named in his honor after he observed it in the Dubrovnik region and supplied several specimens to the German zoologist and physician Karl Wilhelm Michahelles (1807–1834), who subsequently described it (Michahelles 1830; Mlíkovský 2007). Neumayer regularly sent reports on various wild animals to German and Austrian naturalists; for example, he visited the island of Šipan (Dubrovnik Archipelago) in 1826 to gather data on the golden jackal (*Canis aureus* Linnaeus, 1758) (Fißinger 1830).

Neumayer also owned an insect collection (*Diptera*, *Hymenoptera*, *Neuroptera*, *Orthoptera*, *Aptera*, *Orthoptera*) and, following Visiani's instructions, also collected insects (*Coleoptera*, *Lepidoptera*), including butterflies (*Papilionoidea* Latreille, 1802) and scarabs (*Scarabaeidae* Latreille, 1802). He noted that in Dubrovnik these groups were "greedily collected by numerous insect dealers, because of the high profits generated by the trade in these sought-after families; as a result, some of the rarest species have been extirpated from the surroundings of Ragusa (Dubrovnik), and after they were dispersed everywhere, little rare or new can now be found among them" (letter of 26 April 1839/40, Table 1). His letters also reveal that he possessed a collection of amphibians (*Amphibia*), and that he had left in Vienna "a fine and large collection of grasses, as well as an almost complete collection of mosses (*Musci*) and dried lichens (*Licheni*)," which, as he wrote, were to be sent to Dubrovnik (letters of 10 October 1836; 4 November 1837; 2 February 1838, Table 1).

Neumayer's dedication to natural history is evident in his offer to Visiani of a collection comprising approximately one hundred species of mollusks from southern Dalmatia, which he proposed to exchange for books on natural history in any European language (letter of 27 October 1839). In the same letter, he notes that, through the intermediary of the physician and naturalist Pietro Doderlein, specimens from his collection were sent to Padua for exhibition, although the letter does not indicate the intended recipient nor the specific exhibition in question.

Neumayer's letters to Visiani showed that he also conducted mineralogical surveys on behalf of researchers in Vienna, working in the region of Kotor, along the Cetina River (Middle Dalmatia), and in the coal mines between Sinj and Knin (letter of 9 August 1836; letter of 12 March 1840). Neumayer's knowledge of this subject likely stems from his joint research with Heinrich Kratter, who also authored two books on the topic (Kratter 1825, 1840).

Conclusions

Joseph Martin Neumayer exemplifies the vital role of early 19th-century local collectors in advancing botanical knowledge. His systematic surveys across southern Dalmatia, its islands, and high-altitude sites provided valuable specimens that enriched Roberto Visiani's "Flora Dalmatica" and supported the description of seventeen taxa new to science. Beyond contributing material, Neumayer's correspondence and careful documentation reveal the challenges, dedication, and collaborative networks that underpinned the scientific practice of this period. His legacy highlights how individual collectors bridged local knowledge and formal research, leaving enduring insights into the region's flora, some of which remain rare even today.

Acknowledgements

The authors would like to thank the staff of the Archive of the Botanical Garden of the University of Padua for their assistance. We also extend our thanks to Snježana Vujčić Karlo for facilitating access to the Domenico Pappafava herbarium collection in Zadar. Two reviewers and Section Editor are also thanked for their helpful suggestions. The study was funded by institutional resources.

References

Anonymous (1833) Almanacco della Dalmazia per l'anno 1833. Demarchi, Zara, 187 pp.

Bačić J (2001) Antun Drobac (1810.–1882.), prilozi za biografiju [Antun Drobac (1810–1882), biographical sketches]. Prirodoslovlje 1: 155–162.

Barbarić-Gaćina J (2007) Herbarijska zbirka Domenica Pappafave – taksonomska i korološka analiza [Domenico Pappafava's herbarium collection – taxonomic and chorological analysis]. MSc Thesis, University of Zagreb, Croatia.

Beck-Mannagetta G (1901) Die Vegetationsverhältnisse der illyrischen Länder. In: Engler A, Drude O (Eds) Die Vegetation der Erde. Sammlung pflanzengeographischer Monographien 4. Wilhelm Engelmann, Leipzig, 7 pp.

Bogdanović S, Brullo S (2015) Taxonomic revision of the *Limonium cancellatum* group (Plumbaginaceae) in Croatia. Phytotaxa 215(1): 1–87. https://doi.org/10.11646/phytotaxa.215.1.1

Bogunović M, Vidaček Ž, Racz Z, Husnjak S, Sraka M (1996) Namjenska pedološka karta R. Hrvatske u mjerilu 1:300.000 [Basic soil map of the Republic of Croatia at the scale of 1:300,000]. Zavod za pedologiju, Agronomski fakultet, Zagreb.

Braumüller W [Ed.] (1853) Verhandlungen des zoologisch-botanischen Vereins in Wien, Band III, K.K. Hof-Buchhandlung, Wien, 19 pp.

Byalt VV, Bubyreva VA, Orlova LV (2008) The history of Eduard Lindemann's collection kept in the Herbarium of the Botany Department of St. Petersburg State University (LECB). Taxon 57(1): 275–278.

Carrara F (1846–1848) La Dalmazia descritta. Fratelli Battara, Zara, 93 pp.

Clementi M (2017) A cross-disciplinary study of the work and collections by Roberto Visiani (1800–1878). PhD Thesis, University of Padua, Italy, 149–151 pp.

Coen G (1996) Stanje botaničke znanosti Dalmaciji u prvoj polovini 19. stoljeća [The state of botanical science in Dalmatia in the first half of the 19th century]. In: Coen G, Petricioli M (Eds) Prvi botaničari u Zadru. Narodni muzej, Zadar, 5–6.

Coen G, Petricioli M (1996) Prvi botaničari u Zadru [The first botanists in Zadar]. Narodni muzej, Zadar, 104 pp.

Conti F, Reich D, Gutermann W (2020) Notes on the genus *Echinops* L. (Asteraceae) in SE Europe. Adansonia, sér. 3, 42(3): 95–104. https://doi.org/10.5252/adansonia2020v42a3

Čvrljak K (1993) Josip Vincent Host. Botanički put po Istri, Kvarnerskim otocima i Dalmaciji započet 14. kolovoza 1801, a dovršen 6. kolovoza 1802. [Josip Vincent Host. A Botanical Journey through Istria, the Kvarner Islands, and Dalmatia, begun on 14 August 1801 and completed on 6 August 1802]. Matica Hrvatska - ogranak Rijeka, Rijeka, 296 pp.

Dietrich LF [Ed.] (1862) Encyklopädie der gesammten niederen und höheren Gartenkunst. Arnoldische Buchhandlung, Lepizig, 628 pp.

Dohrn CA (1854) Verelosangelegenlieiten. Entomologische Zeitung 15(1): 6–11.

Durberšić P (2011) Croatian entomofauna. Looking back from the present and future plans. Entomologia Croatica 15(1–4): 17–101.

Egmond F (2010) The World of Carolus Clusius: Natural History in the making, 1550–1610. Ed. 1. Routledge, London, 320 pp. https://doi.org/10.4324/9781315656151

Fißinger LF (1830) Über den Schacal Dalmatines von L. F. Fißinger. In: Isis von Oken Heft IV. Oken L (Ed.) Jena: Expedition der Isis. Brockhaus, Leipzig, 372–376.

Grubišić S (1983) Visiani i rodni grad Šibenik [Visiani and his hometown Šibenik]. In: Pavletić Z, Matković P, Grubišić S (Eds) Zbornik Roberta Visianija Šibenčanina. Muzej Grada Šibenika, Šibenik, 27–48.

Hoppe DH, Fürnrohr AE (1836) [Untitled note] Flora oder allgemeine botanische Zeitung 19(1): 29–31.

Hoppe DH, Fürnrohr AE (1841) [Untitled note] Flora oder allgemeine botanische Zeitung 24(11): 175–176.

Inić S, Gašparac P (2022) Overview of Dioscorides' recipes in Croatian books of folk recipes. Die Pharmazie 77(7): 270–277. https://doi.org/10.1691/ph.2022.2027

Jahn I [Ed.] (2000) Geschichte der Biologie: Theorien, Methoden, Institutionen, Kurzbiographien. Ed. 3. Spektrum Akademischer Verlag, Heidelberg, 1088 pp.

Jasprica N, Carić, M, Batistić M (2003) The marshland vegetation (*Phragmito-Magnocaricetea*, *Isöeto-Nanojuncetea*) and hydrology in the Hutovo Blato Natural park (Neretva River delta, Bosnia and Herzegovina). Phyton Annales Rei Botanicae (Horn) 43(2): 281–294.

Jasprica N, Hafner D, Batistić M, Kapetanović T (2005) Phytoplankton in three freshwater lakes in the Neretva River delta (Eastern Adriatic, NE Mediterranean). Nova Hedwigia 81(1–2): 37–54. https://doi.org/10.1127/0029-5035/2005/0081-0037

Judson PM (2016) The Habsburg Empire. A new history. The Belknap Press of Harvard University Press, Cambridge, 567 pp.

Kratter H (1825) Versuch einer Entwicklung der Grundbegriffe, die Meteorsteine, und Darstellung der vorzüglichsten Hypothese, ihren Ursprung betreffend: zum Gebrauche für angehende Physiker und Naturforscher. Druck und Verlag von J.B. Wallishausser, Wien.

Kratter H (1840) Die Mineralquellen zu Szczawnica im Königreiche Galizien physikalisch chemisch untersucht von Th. v. Torosiewicz. Piller, Lemberg.

Kršinić F (1988) Prirodoslovni muzej u Dubrovniku [Natural History Museum in Dubrovnik]. Vijesti muzealaca i konzervatora Hrvatske 37(3–4): 20–22.

Kršinić F (1989) Dubrovački prirodoslovni muzej [Dubrovnik Natural History Museum]. In: Meštrov M (Ed) Ekološke monografije 1. Hrvatsko ekološko društvo, Zagreb, 311–328.

Lindemann EE (1884) Dritter Bericht über den Bestand meines Herbariums. Bulletin de la Société impériale des naturalistes de Moscou 60(2): 265–312.

Lindemann E (1885) Dritter Bericht über den Bestand meines Herbariums. Bulletin de la Société impériale des naturalistes de Moscou 61(1): 37–90.

Linnaeus C (1751) Philosophia Botanica. Godofredum Kiesewetter, Stockholm, 362 pp. https://doi.org/10.1093/oso/9780198501220.002.0005

Marić M (2024) Island of Lemons in bloom. Gardens of the Archduke Maximilian of Habsburg on the Island of Lokrum. Dubrovnik Branch of Matica Hrvatska, University of Dubrovnik, Dubrovnik, 99 pp.

Marwinski F (1981) Aus der Arbeit der Bibliothek des ehemaligen Deutschen Entomologischen Institutes: Nachlässe, Konvolute etc. Beiträge zur Entomologie 31(1): 27–82.

Mägdefrau K (1992) Geschichte der Botanik: Leben und Leistungen großer Forscher. 2nd edn. Gustav Fischer Verlag, Stuttgart, Jena, New York. https://doi.org/10.1002/fedr.19931040308

Médail F (2008) Ecosystems: Mediterranean. In: Jørgensen SE, Fath B (Eds) Encyclopedia of Ecology. Vol 3. Elsevier, Oxford, 2296–2308. https://doi.org/10.1016/b978-008045405-4.00348-7

Michahelles K (1830) Über einige dalmatinische Vertebraten, die zugleich im westlichen Asien vorkommen. Isis von Oken 23(8): 809–82.

Mlíkovský J (2007) Type specimens and type localities of Rock Nuthatches of the Sitta neumayer species complex (Aves: Sittidae). Journal of the National Museum (Prague), Natural History Series 176: 91–115.

Minelli A (2025) Travels of European botanists of the 16th-18th centuries in search of Mediterranean plants described by Dioscorides and Theophrastus. Webbia 80(1): 5–13. https://doi.org/10.36253/jopt-17353

Nikolić T [Ed.] (2024) Flora Croatica database. Prirodoslovno-matematički fakultet, Sveučilište u Zagrebu. http://hirc.botanic.hr/fcd [accessed on 10.12.2024]

Nikolić T, Milović M, Bogdanović S, Jasprica N [Eds] (2015) Endemi u Hrvatskoj flori [Endemics in Croatian flora]. Alfa d.d., Zagreb, 492 pp.

Nikolić T, Topić J, Vuković N [Eds] (2010) Botanički važna područja Hrvatske [Important plant areas in Croatia]. Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu, Školska knjiga d.o.o., Zagreb, 529 pp.

Petter F (1843) Botanischer Bericht aus Dalmatien. Flora oder allgemeine botanische Zeitung 26(16): 257–263.

Petter F (1853) Uebersicht in Bezug auf die botanische Erforschung Dalmatinens. Verhandlungen des Zoologisch-Botanischen Vereins in Wien 3: 18–23.

Pliszko A, Łazarski G (2024) *Silene coronaria* (Caryophyllaceae), an established alien plant in the flora of Poland. Botanica 30(4): 173–178. https://doi.org/10.35513/Botlit.2024.4.5

POWO (2024) Plants of the World Online. Royal Botanic Gardens, Kew. http://www.plantsoftheworldonline.org [accessed on 10.12.2024].

Pandža M, Jasprica N, Škvorc Ž, Milović M, Karađole J (2026) A phytosociological description of a new plant association of the *Saturejion subspicatae* alliance in southern Croatia (SE Europe). Acta Botanica Croatica 85(1): 1–13. https://doi.org/10.37427/botcro-2026-008

Petricioli M (1996) Friedrich Ludwig barun von Welden. In: Coen G, Petricioli M (Eds) Prvi botaničari u Zadru. Narodni muzej, Zadar, 26–33.

Pulević V (2006) Botaničari i Crna Gora [Botanists and Montenegro]. Prirodnjački muzej Crne Gore, Podgorica, 458 pp.

Pulević V, Vincek D (2004) Crna Gora vrata Balkana: putopisi i zapisi evropskih botaničara [Montenegro, the gateway to the Balkans: travelogues and records of European botanists]. Ed. 2. Obod, Cetinje, 787 pp.

Reichenbach L (1830) Flora germanica excursoria ex affinitate regni vegetabilis naturali disposita, sive principia synopseos plantarum in Germania terrisque in Europa media adjacentibus sponte nascentium cultarumque frequentius. Carolum Cnobloch, Lipsiae, 508 pp. https://doi.org/10.5962/bhl.title.309

Rusković Krištić M (2012) Zbirka libreta znanstvene knjižnice u Dubrovniku: pregled dosadašnjih istraživanja s opisom zbirke [The libretto collection of the scientific library in Dubrovnik: an overview of previous research with a description of the collection]. Anali Dubrovnik 50: 281–303.

Sánchez-Jiménez I, Hidalgo O, Garnatje T (2012) *Echinops spinosissimus* Turra subsp. *neumayeri* (Vis.) Kožuharov (Asteraceae, Cardueae): a new record for the flora of Greece. Adansonia, sér. 3, 34(1): 129–132. https://doi.org/10.5252/a2012n1a15

Stearn WT (1958) Botanical exploration to the time of Linnaeus. Proceedings Linnean Society London 169(3): 173–196. https://doi.org/10.1111/j.1095-8312.1958.tb01472.x

Šilić Č (1984) Endemične biljke [Endemic plants]. Svjetlost, Sarajevo, 205 pp.

Šolić E (1983) Poznavanje flore Biokova od Visianija do danas [Knowledge of the flora of Biokovo from Visiani to the present day]. In: Pavletić Z, Matković P, Grubišić S (Eds) Zbornik Roberta Visianija Šibenčanina. Muzej grada Šibenika, Šibenik, 349–364.

Tišljar J, Vlahović I, Velić I, Sokač B (2002) Carbonate platform megafacies of the Jurassic and Cretaceous deposits of the Karst Dinarides. Geologia Croatica 55(2): 139–170. https://doi.org/10.4154/gc.2002.14

Vick EB (2014) The Congress of Vienna: Power and politics after Napoleon. Harvard University Press, Cambridge, 448 pp. https://doi.org/10.1017/S0067237816000242

Visiani R (1826) Stirpium dalmaticarum specimen. Crescinianis, Patavii, 57 pp.

Visiani R (1842) Flora Dalmatica sive Enumeratio stirpium vascularium quas hactenus in Dalmatia lectas et sibi observatas descripsit digessit rariorumque iconibus illustravit, vol. I. Friedericus Hoffmeister, Lipsiae, 252 pp.

Visiani R (1847) Flora Dalmatica sive Enumeratio stirpium vascularium quas hactenus in Dalmatia lectas et sibi observatas descripsit digessit rariorumque iconibus illustravit, vol. II. Friedericus Hoffmeister, Lipsiae, 268 pp.

Visiani R (1852) Flora Dalmatica sive Enumeratio stirpium vascularium quas hactenus in Dalmatia lectas et sibi observatas descripsit digessit rariorumque iconibus illustravit, vol. III. Friedericus Hoffmeister, Lipsiae, 390 pp.

Visiani R (1872) Florae dalmaticae supplementum. Opus suum novis curis castigante et augente Roberto Visiani. Typis Josephi Antonelli, Venetiis, 189 pp.

Visiani R (1877) Florae dalmaticae supplementum alterum, adjectis plantis in Bosnia, Hercegovina et Montenegro crescentibus. Pars I. Memorie del Reale Istituto Veneto di Scienze, Lettere ed Arti 20, 103 pp.

Visiani R (1882) Florae dalmaticae supplementum alterum, adjectis plantis in Bosnia, Hercegovina et Montenegro crescentibus. Pars II. Memorie del Reale Istituto Veneto di Scienze, Lettere ed Arti 21, 72 pp.

Vujčić-Karlo S, Barbarić-Gaćina J, Coen G (2009) Domenico Pappafava i njegova oštavština rodnom Zadru [Domenico Pappafava and his legacy to his native Zadar]. Prirodoslovni odjel. Narodni muzej Zadar, Zadar, 20 pp.

Visković R, Domanovac B (1987) Konstantin Neumayer-Žunjević – stomatolog i društveni radnik [Konstantin Neumayer-Žunjević – dentist and social worker]. Acta Stomatologica Croatica 21(3): 253–258.

Vukelić J (2012) Šumska vegetacija Hrvatske [Forest vegetation in Croatia]. Šumarski fakultet Sveučilišta u Zagrebu, Državni Zavod Za Zaštitu Prirode, Zagreb, 403 pp.

Welden von L (1836) Über die Vegetation Dalmatiens. Annalen der Erd-, Völker- und Staatenkunde 1: 233–243.

Welden von L (2023) Natural history specimens collected and/or identified and deposited. https://doi.org/10.5281/zenodo.8278132